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FORM PTO-1390 (REV 12-29-99) | U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

US APPLICATION NO (If known, see 37 CFR 1 5): 09/582634

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/IB99/00178	29 JANUARY, 1999	30 JANUARY. 1998

TITLE OF INVENTION: SHIRWO SYSTEM (A New Internal Combustion Power System)

APPLICANT(S) FOR DO/EO/US: Shirwan, AL PASH AL BAHDAINI

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☐ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:

A- First Page of Published PCT Application # WO99/09090
B- 3 Pages of International Search Report (PCT/IB99/00178)
C- A letter to USPTO Dated 26, July 2000
D- Notification of Recording of A Change.
E- Receipt.

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/582634	PCT IB99/00534	

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17. ☒ The following fees are submitted:	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$970.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$840.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$690.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$670.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **$96.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 840.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		X **$18.00**	$	
Independent claims	- 3 =		X **$78.00**	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$260.00**	$	

TOTAL OF ABOVE CALCULATIONS =	$ 840.00	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also by filed (Note 37 CFR 1.9, 1.27, 1.28).	$	
SUBTOTAL =	$	
Processing fee of **$130.00** for furnishing the English translation later than ☐20 ☐30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	$	
TOTAL NATIONAL FEE =	$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$	
TOTAL FEES ENCLOSED =	$ 840.00	
	Amount to be refunded:	$
	charged:	$

a. ☒ A check in the amount of $840.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☐ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. _____. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO

ALPASHA AL BANDAINI, Shirwan
Rue David Dufour 8,
CH-1205 Genève
Switzerland

SIGNATURE

NAME

REGISTRATION NUMBER

PTO/SB/09 (12-97)
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Patent and Trademark Office, U S DEPARTMENT OF COMMERCE

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STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (Optional)

Applicant, Patentee, or Identifier: Shirwan AL PASHA AL BAHDAINI

Application or Patent No: 09/582,634

Filed or Issued:

Title: SHIRWO SYSTEM(A NEW INTERNAL COMBUSTION POWER SYSTEM)

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1 9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in

- [ ] the specification filed herewith with title as listed above
- [x] the application identified above
- [ ] the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- [x] No such person, concern, or organization exists.
- [ ] Each such person, concern, or organization is listed below

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

Shirwan Al Pasha Al BAHDAINI		
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
Signature of inventor	Signature of inventor	Signature of inventor
Date 08 Sep. 2000	Date	Date

Burden Hour Statement This form is estimated to take 0 2 hours to complete Time will vary depending upon the needs of the individual case Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231 DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS SEND TO: Assistant Commissioner for Patents, Washington, DC 20231

-- SHIRWO SYSTEM --

(A NEW INTERNAL COMBUSTION POWER SYSTEM)

INTRODUCTION

This is a research of a new system's design for internal combustion engine with a better fuel's energy utility ,by using more potential powers in this system due to improving and maximising the fuel energy ,then computerising them to increase torque power in a small simple automotive power engine. With economical industrial methods of manufacturing and more advanced practical ways of controlling engine activities for various engine outputs with improvement ways of reducing fuel consumption.

It was a ten year old dream of the inventor to design a powerful internal combustion engine, flexible in operation with its economic fuel consumption and more harmonic in performance ,utilising the computer progress .By this technology .A power engine that could become so close to Man's order to be as a living object.

A new environment-friendly generation of a clever combustion engine may appear, since it depends on those technique and universal physical principals, those used in flying and beyond it i.e. spaceship flying in atmosphere free from earth's gravity; all inside this engine discipline. Of course many diverse scientific researches are needed for developing its fabrications (theoretically) in order to reach the best conclusions for various proposals in implying this system for different kinds of work with best economical commercial productions for each.

This concept contains extensive principles, it needs to be developed scientifically and mathematically in Classified industrial laboratories to conclude the various designs according to the production `s standard requires.

It has been more than hundred years since the invention of Otto petrol internal combustion engine had appeared, still used until now to supply automotive power. The fast progress in the world, the financial developments, the economical problems and the increase of pollution on earth, make it necessary to develop a new automotive engine . A new system that could convince the environmentalist organisations and the consumer recent requirements by using advance technology with computer control with better specifications and performance by this system .Thus it apply promoting solutions to future environmental problems with economical in, production and fuel consumption.

It's time to reconsider the way of using the potential energy of Petrol fuel in producing automotive energy for the light power equipment. In away to improve the

principal of fuel combustion in the engines to be in its maximum useful potential advantage in producing torque power inside a small simple economic machine.

Using the facilities of advanced scientific techniques and the recent progress of computer control systems in most industries.

Wishing to be a very useful system to solve future problems in a better use of Petrol-God's generous gift to Man, the best powerful valuable cheap material; by an efficient ways of utilising automotive energy from it with economical consumption hopefully to be used in the 21st century .and to be invested by all the world for peace purposes and human progress

This system `s research:

This a brief configuration contains: description, major changes, design principal (back ground), composition & accessories, engine performance & analysis of potential ways of producing torque power, useful industrial & commercial characteristics, it's various design proposals, drawings contents, drawings(Figs) details and then Claims & abstract.

..... DESCRIPTION .....

S-H-I-R-W-O: (SPEEDY, HARMONIC-HYDRAULIC, INDEPENDENT-INTENSITY, ROTARY, WHEEL , OPERATING)

SYSTEM: A SPECIAL MECHANICAL DISCIPLINE FOR INTERNAL COMBUSTION ENGINE.

A new compact power engine designed to use the fuel chemical energy in specific relations with additional natural physical forces by using of many dynamic principles computerised by new techniques of this mechanical metal machine to produce better torque output powers.

This is a mechanical engine of internal combustion system, produces torque power from Hydrocarbon combustion energy using any types of gasoline fuel or could use Jet kerosene or gas fuel in this principal; to produce powers from expanding gases volume i.e. pressure of gases that result from fuel fast burning (combustion emission gases) in closet chambers, and transfer these powers to torque movement, using specific but simple components working in one connected system that applies additional potential powers to normal said fuel energy and provides pioneer industrial and commercial characteristics in a compact power engines.

A practical engineering design that composes types of recent combustion principles, which produce torque power from fuel: piston, rotary and turbine in one compact composite system engine unit.

This system with its mechanical design will use a new way of circular distribution for pistons locations in engine case with the advantages of this locations in the work that apply more potential powers to fuel (additionally) on engine output with other good advantages.

This mechanical system is designed in away to use the fuel **chemical** energy in high efficient manner and adding to it : almost in-visible powers.

After the instance of fuel combustion . There will be powers that can be agitated due to the physical dynamic principals which are placed to happened inside this discipline . These nature powers that agitate due to dynamic effects on the elements will effect due to this mechanical design .

By utilising the advantages of specific gas characteristic in closed chamber (combustion gases in the chambers) and the ways of chambers placed in the circular zone in this engine . There will be powers that agitated. The aerodynamic energy of the hot exhaust gases of the chambers will be agitated also in a specific way to be used. This engine's discipline will computerised the distribution of these powers to effect all in positive resultant on the same direction -with the fuel mixture combustion power - on torque crank to maximise the output power in the engine for the said fuel .

These physical energies used to be ignored until now .That is because the conventional engines depending only on the visible effect of the direct fuel explosion pressure power inside. Neglecting the physical dynamic energy effect that could happened due to specific movements on the elements ,inside the engine parts movement if they were put in the right way .Since there is no discipline to concentrate these energies to be used positively in these engines.

This is a new way of magnifying the fuel potential chemical combustion energy by existing the dynamic nature physical principals inside the discipline of the engine and using the resultant to increase the engine output for the said fuel. many powers would result due to the discipline of this design .These will be utilised **to act all positively** on the same target i.e. magnifying fuel combustion power output ,maximising this said energy that used for the same application . It will increase the output and reduce the said fuel consumption.

THE PRINCIPAL OF THIS SYSTEM DESIGN (Back Ground):

The conventional pistons combustion engines depend on a set of piston cylinders fixed in engine case (chassis) using reciprocated push-arm between pistons and a zek-zak crank shaft connected with them in determined angles by mounting frictional minimising pads, transferring torque depending only on this direct contact principle of dynamic.

This mechanical design are seated up in a discipline to use the direct contact dynamic and also by deliberates and **agitates** some physical energies, to appear then producing potential positive influenced powers that all will act in the same way with fuel i.e. in applying powers on engine crank.

The positive summation reaction (resultant) of those energies will devolve to act positively on output after fuel combustion occurred inside chamber(s), which could be driven to produce more output power on the crank; as the system's extra physical powers.

This positive resultant power reaction due to the system design (at typical mod) of:

1. Natural elastic characteristic of element (gases, spring or hydraulic device resistant).

2. Natural aerodynamic power of gases by the potential energy of exhaust gases.

3. Natural physical principle of the centrifugal potential power (appears at high speed).

These natural energies appear due to movement effects on elements in this discipline which let new potential energies occur, instantaneously after the occupation of fuel combustion in chamber of (said) fuel then maximising output in this system. The positively reaction of any of these power will be in relation to engine design and speed situations.

The mechanical design of this system would keep a minimum energy loss(from combustion power) inside due to it's simple machinery (recent systems lose rate 20-40% due to their, machinery parts, friction, heat.....etc) which affects on the power-weight relation, thus this system could assume:

Almost total potential fuel combustion's energy will transfer to torque power.

Although the speed could be invested in this design **in reducing** the fuel consumption automatically.

The main target (by the inventor) of this system was in setting separate power units in one engine and the ability of changing any units performance output automatically by easily management from out side; in a small compact engine. The scientific research could conclude from the following description that ,this new spark internal combustion

system: A system of **any piston (or group) can work independently maintaining smooth performance without disturbs engine efficiency, a system utilising the potential physical powers in output and can counter the fuel consumption in increasing speed.** This system could be performing as a multi-purpose engine depends on types of works. An engine of economical production by deducting many industrial requirements, reducing the lines of production these mean reducing costs.
The design will provide many good industrial techniques briefly like:

A better engine performance, less fuel consumption, a perfect with flexible or automatic output, a built-in pollution treatment, a devisable design proposals with less industrial requires, economical productions and easy, long duration maintenance and perfect computer control for almost all the engine activities and other things.

MAJOR CHANGES (IN TECHNIQUES):

The techniques in this principal totally differ from those recent systems, known as: **Otto, Diesel, Wangle** or those with modified DOHC, SOHC or even **Turbine system.** The global change is in the basic design from those internal combustion engine: it is by using wheel(s) inside engine; containing piston's cylinders in a discipline that could transfer fuel energy with additional potential energies into torque power in the engine beside other major changes which would apply good industrial advantages.

A system of various power stroke, one or two or three or more piston power strokes as required(at the same, part-on the crank);at one crank rotation, no energy loss stroke !

A system-using engine with rotating wheel(s) fixed on straight crankshaft!

A system of independent piston performance related to crank shaft or other pistons!

A flexible (elastic characters) piston push-arm to transfer potential energy to torque!

A system using charged (pressured) air-fuel mixture (beyond turbo);in spark engine!

A system combining piston & rotary & turbine techniques in one compact engine!

A system of different cylinder and other type of valves in the discipline and places!

A system that agitates & utilise Physical nature's principals energies in output !

A system using aerodynamic power of exhaust gases to act as turbine output power!

A system that could reverse the, high fuel consumption; due to speed increase!

A system with less transferred combustion energy Loss to torque by its machinery!

A system leads to set an automatic parts performance output unit in one engine!

A better fuel combusting in all fuel's situations using elastic flexible space chambers!

A system could be used in horizontal or vertical crank (torque shaft); direction!

A system treating pollutant in practical ways with a built-in techniques engine!

A system of good output, slow or high speed, safe performance in one engine unit!

A system cheap less industrial requires and simple maintenance!

This configuration is theoretically expected, it depends on scientific principles and could be developed and practically concluded. More new extensive characteristic could be reached by the assistance of the specialised automotive laboratories using the available advanced techniques of: the metal alloys, dynamic principals, liquid hydraulic data , information available for composition's elements , the required dimensions with the industrial specifications and assistance of computer processing in design, even in management of control the engine activities and various performances for multi-power output for development of this system.

This new system with it's design principal and its principles included will change the way of transferring the fuel energy to torque power, maximising this energy than before. Using simple applications depending on different mathematical equations from those used in recent internal combustion systems, this system will apply extra value for fuel energy.

The fundamental principal for this system and it's principles, could be developed to be used now as: **a new advanced system**, whenever these facilities available, or a part(s) of its principles could be used now **(i.e. partially used)** in order not to interrupt or influence those recent automotive industries in order to prevent any sudden commercial impact in their productions.

However using any of these principles should be referred to this **(research).**

MANY SPECIFIC CHARACTERISTICS WOULD BE INDICATED IN THIS CONFIGURATION.

THE MECHANICAL COMPOSITIONS & ACCESSORIES DISCIPLINE

Compositions as per the typical drawings of : .....

The three wheel unit -of 2 - pistons , engine

1. Out side Case (the engine body chassis) a metal cylindrical or octagonal shape (as in the drawings) with a diameter of 330-380 mm in horizontal-position on crank and approx..length (as drawing) of 550-650 mm with a large cylinder cavity of 301 mm. Contains trenches for seals, tunnels for oil, water and places for valves with special exhaust openings. The industrial requirement may divide it into two parts upper and lower or more. (Det-2 Fig : 2/25 &, 3/25, 4/25).

The manufacturing of engine case by coasted steel alloy with trench's & tunnels.

2. The Crank (as crank shaft) a torque output shaft is a straight solid steel iron, placed on the horizontal centre line of the engine along the Case length and extended more, its diameter 25 mm-50mm ;at the connecting points with the Case by ball bearings, which allow it to rotate only on its centre line. It contains oil tunnel in the centre line ,contains holes for linking oil feeding to rotating parts. Its surface geared (grooved) to interlock trinket with the rotating parts to move all together. (Det-6 Fig : 2/25 & 4/25)

3. Power wheel units (Energy production units) metal wheels (3 in this drawing) each one is a solid strong light alloy wheel, a diameter of 300 mm and a width of 120 mm with smooth surface(s) strengthen by (anti smashed) alloy, contains (here) two cylindrical hollow (cavity) with opening placed in opposite directions with smooth internal surfaces Bore. The pistons placed in each one. Its diameter (here) 80 mm and length of 120-180 mm depending on the industrial requirement data. Each cavity base with two small oil stores (sumps) one which receives oil by tunnel linked with main supply tunnel (canal) in crank for intake lubrication oil to feed piston arm.

Other store of outlet oil flow from piston arm to be disposal by other tunnel into wheel side. An opening between these two sumps in the wall between maintains the feeding store in a full situation always. The central grooved hole of the wheels to interlock the connection with Crank (torque output shaft). There are two washers around the crank on the two sides of each wheel for oil lock. There are two trenches in outer circular circumference face of the wheel for fixing a

pair of side circular gas-oil wheel slider-seals. The number of these wheels depending on the design and output ability of the engine.

The direction of the longitudinal centre line of any piston's cylinder in a wheel differs from the near cylinder of other wheel in a known angle that could be found from dividing 360° by the numbers of total cylinders in a typical engine.

The crank may be trenched according to the wheel numbers for easy assembling that starts with cooling pad and wheels in required angles and ball bearings particularly i.e. all rotating parts to be geared together on the crank, by pressing exactly at its designed places before fixing the crank in its Case position. (Det-3, Fig 2/25 & 5/20)

The manufacturing of power wheels units could be done by costing alloys with trenches, setting drilling, wielding tunnels, modified circumference and grinding cylinder bores as these would be the main standard mass production units in any engine design industry line for each proposal.

4. The pistons: each one is of solid metal alloy high resistance light disk, fixed inside the cylinder with 20-35 mm thickness nearly the same cylinder Bore diameter. It contains in grooves the circular seals for gas and oil. There are suitable two middle inside tunnels for lubrication oil inlet and outlet that linked with the build-in pump at push-arm device top end. There are other smaller radial tunnels linked separately with each of these two middle tunnel and piston circular edge to cool piston and to distribute oil to piston wall with Bore surface. A special lubricating seal or two in the oil gap on piston wall to uniform the lubrication of piston circumference with cylinder bore, i.e. between piston and cylinder for good slipping movement. Minimising friction and heat while piston in movement: The piston is connected by wash-bolts with its solid bearing base plate that capping the flexible push-arm. There is a solid steel ring at the top of cylinder Bore fixed in a groove to lock the piston in the cylinder at movement, A suitable curved piston top capping face required (Det.7 –Fig 4/25 & 8/25).

The manufacturing of piston by costing alloy with tunnel, grooves and seals...etc

5. The flexible piston push-arm of metal a pair of stainless steel pipes slipping inside each other (or a couple) fixed vertically on cylinder base inside it. A metal mechanical spring (straight or inclined) around or built-in with the push-arm, used. This method to maintain vertical piston movement. A push-arm design to

work as resistance of elastic character with the required calculation for each proposal. A hydraulic device (like the shock absorber) working as a flexible elastic resistance system with particular reaction (capacity) depend on type of engine could be connected the piston to the wheel at cylinder base in vertical movement ability only (same that spring or device which used automatic weapons to re-fill, artillery guns etc). (Det – 8, Fig 4/25, 8/25 & 11/25)

6. The piston lubrication pump, is made from pair of sliding pipes each of two small stainless steel pipes slide in each other contain tunnel inside it for oil, consist one way oil valve (check valve) for each inlet; in opposite direction (a valve, using solid small ball locked in a small chamber, an opening with a diameter less than the ball's half spherical shape and other opening of many small hole to let the oil flow at one direction for each position of piston movements) to act as ordinary shaft pump due piston movements (with push-arm). A pump of two opposite direction flow pipe shaft as in the drawing to work also as push-arm device...for example..(Det- 10, Fig 4/25 & 8/25).

7. The cooling & lubrication pads: each one of light alloy with radial trenches, i.e. grooves starting from central pad sump to the edges attached the wheel side-wall, working almost same as a centrifugal circular pump. A diameter a bout the same of wheels, and an opening of oil from central Crank tunnel for feeding to bring oil from the crank to distribute it on wheel walls, cooling them then disposed to the circumference edge then to outside wall Case tunnels. It contains low (or high) part(s)zones at the modified differential smooth edge in certain places against each chamber .For slipping and controlling the mechanism bar timing system of the air and air-fuel mixture valves, for each wheel when rotating with the crank. This is the way of computerising the timing of valves opening against particular chambers, in the right time. It is a simple, easy, brief, oil moisturised and a perfect independent mechanism way across the Case for each wheel unit. (Det- 17, Fig 3/25 & 7/25).

8. The seal masses anti-gases, fixed in the Case: each of metal alloy (or hard anti-heat plastic combination) according to its work which is the anti-gas seal attached the wheel wide circumference face. It could be in any size but at the same width of each wheel's circumference face. It is attached with the two circular wheel slid-seals (the Case part) at the sides. A right depth fixed from

outside on the case by special looked washer. It could be adjustable; if using adjustable seals (in attached) with the face of wheel by a mechanical controller spring regulator or (automatic thermal regulator). The principle is on connecting between the two circular anti-gas seals in Case parts of each wheel ,and a well attached to the wheel circumference to supply a locked situation for chamber to keep the mod of chambers mix i.e. preventing gases from penetration.

For a metal alloy it could be design in a special way using linear metal seals, fixed in the base of the mass, with various technique methods of oil feeding using the advantage of one way rotation of the wheels.

A relation with rotating direction and existing of special small inclined trenches on the wheel surface in the right place (or on attached pin-mass unite) with automatic opening for oil inlet and outlet holes. This could apply with timing pins in the rotating parts. Using the advantage of one way rotation monitoring oil discharge from Case (or wheel side phase) starting before entrance of the seal and disposes while wheel rotates at a duration enough to lubricate attached zone particularly. This would be guarded with spring solid balls in specific place with each mass with a timing system controlled by edge of one side pad of each wheel,(or the wheel it self)

Another way by applying holes in the circular anti-gas seal system, the special timing controlled opening system depends on one way rotation (i.e. if using circular seal with blade rings in the Case-wheel interlocked parts) at seals. There are special holes on each blade ring that opened across as one hole when connect (blades) all in one fixed point(s) to set across opening hole for oil feeder from Case at required place. The direction of rotation and trenches in a part zone of wheel surface will collect the lubrication drops to the outlet hole (automatic opened) before gases attend reaching the seal mass from far chamber and before even the chamber reaches the seal position maintaining surface in a good slipper. However the gases pressure direction may be used to dispose the oil in the right time. **The number of these seals 3 to 4 and the radian distance between each one is less than the net radian distance between wheel chambers as the distance of specified attached surface.** The lubrication technique are various depending on expert laboratories

The working principle of these **seals in their circular positions around the wheel is to maintain and to transport the locked situation chamber(s) i.e. keeping mod of chamber-mix while each wheel kept in rotation.**

These seal masses are in three type of work.

No 1 for one way anti-gas of air-fuel mixture; when start charging it and the place directly after pure air-valve.

No 2 for two sides anti-gas, a side for the charging air-fuel mixture although other side for gases of chamber after combustion, at place before the power stroke.

No 3 for one way anti-gas of the combustion gases at place before exhaust opening.

The radian distances between these seal are shown in (Fig -10/25)

The size of any seal mass could be designed in order to allow a piston's maintenance preparation i.e. opening from the Case without open the engine Case regarding the simplicity of assembling the piston and push-arm device.

(Det- 19, Fig 4/25 & 5/25 & 10/25 & 20/25)

9. The circular seal anti-gas (wheel-case, oil seals-slider) on the two side's edge of each wheel's circumference are (in various techniques). A suggestion of suitable two or three stainless steel blade rings mass fixed in special grooves in the wheel (or) with one set parts in Case and wheel to be interlock together when fixing the parts of the engine, using separated pair pieces fixed in Case, other ring fixed on operating wheel. The seals components would formed together a tithing and a sliding device to protect the pads from any penetration of combustion gases (and maintaining the required locked chamber for mod of mixture). They could be lubricated with special holes in the right place where is no longer pressure on it, (i.e. end of exhaust opening) or using a self-lubrication. This depends on the expert industries laboratory (Det- 26, Fig 2/25 & 3/25).

10. The ordinary oil pump (and subsidiaries) , which fixed in the front of the engine (or else). Connected with the crank to transfer oil from lower store oil tank – that oil flow coming from Case-ended; to the upper(meddle) oil tank which discharges the intake of the main tunnel in the central crank; in which it has its winging (impeller) parts, in a shape that could direct the flow of oil sucking by tunnel's inlet holes in crank which suck it when rotates to discharge it

to pads or pistons in each wheel by its holes depending by the Centrifugal principle for each part. These holes inlets to the engine parts in the crank are in a special design of their opening diameter depending on the distance each from main oil supply (Dec 24, 28 Fig 2A/20). The trenches i.e. grooves in each pad will be filled with oil, feeding from Crank holes flowing due to engine crank ration directed outwardly from centres by centrifugal energy of these parts-diameter due to rotation. The grooves in a way contacting the power wheel units two side-walls, for cooling as to reduce adiabatic. This is the enthalpy heat system of each power wheel unit. The oil flow would exchange the heat of cylinders after fuel combustion. The pistons get their lubrication oil with the same principle, from a small tank (sump) in the base of each cylinder as in take store that would be refilled always (by arrange an opening in top of bond between the inlet and out let store with excess length of its labr. rod-intake tunnel). The demand of lubrication oil for each piston would be supplied as its movement. The piston will take sufficient lubrication oil by its lubrication pump fixed in its push-arm that suck oil with any little movement ,supplying the piston needs then due to flowing will directed out side by out flow tunnel to outlet sump ,then far from wheel centre to wheel side wall .Then drop it in the pad trenches due to rotation . By the same principle (Centrifugal principal) (Det-: 10,11,15,17,28 Fig: 2/25 & 3/25).

11. The valves of air-fuel mixture and pure-air ,air check valves: are of the same shape, on the case ,each is in a separate short pipe device contains valve of a triangular wide back opposite to the air pressure supply direction , moving in a same triangular or curved shape opening. It is guarded with spring. The place is in Case wall far away from firing zone to be directed at central of the wheel circumference surface and to be opened at the right time against chambers. They are controlled by rotation of cooling pad in a side of each power wheel, with a simple mechanical elastic rod system connected with in the pad modified edge. There is a small smooth roller ended at rod that (which is oil saturated) attaching the pad differential edge for timing the opening by the meaning of lower (or upper) zone on the pad edge using this mechanism to transport and control the opening movement to valves.

(Det- 20,21,22. Fig 4/25 & 7/25).

The air-fuel mixture valve is to supply and charging the air-fuel mix to chamber.
The pure-air valve is to supply the fast (pressured) to chamber for cooling and scavenging the after burn gases in chamber by pure air.
The two valves in each wheel charged consecutively with pressured air by one device to their two pipes from the same resource (pressured air cylinder or centrifugal turbine) which connected with engine rotation.
The principle of distributing the air between the two pipes for chambers i.e. the different angles (i.e. different timing), maintaining the required pressure for both air-fuel mixture and pure air (scavenging on chamber) at various speeds.
The controlling requirement could be by using out let opening regulator of pressure release of main air supply (i.e. a reducing of that opening in higher speed mean more pressure to engine). Using a device before air enters the two pipes. The fuel would be splashed at required mixture or various rate (as required) to charge the pressured air directed to ignition with fuel in order to supply the chambers with the energy mixture before firing power stroke.
This could be done by a simple device of a needle valve(s) or simple sub carburettor or with additional mechanical or electrical computerised system as indirect injection (pre-mixing in feeding pipe or sub-store for each chamber).

12. The ball bearings fixed in engine Case for holding the Crank by connecting it with Case from two sides or more . (Det – 27 Fig 2/25 & 3/25).

13. Water pump as known in the front side of engine (or out of engine) with its outer radiator pipes, with Case water cooling system tunnels (canals) to cool returning hot oil and all Case. (Det – 23 Fig 2/25, 3/25) if required or using air cooling system instead of.

14. The exhaust opening in the Case for each wheel : starting with a small graded increasing opening in the direction of rotation in a special aerodynamic criteria then specific wings designed in the outlet of exhaust pipe in order to make the escaped gases at exhaust stroke take penetration position in a perfect way to produce a potential aerodynamic power reaction on the wheel to act on the same direction of rotation.
The principle used here is to use and reverse the flying principle which utilising the fast air produced by plane fan to produce fast air turbulence on the air-plane wings to fly. In this design an assumption of a fixed fan (the exhaust special

opening) will be under fast air reaction (the combustion resultant gases, under pressure) the wheel free to move (as a plane) i.e. wheel will be under reaction of an excess potential power to rotate it, assuming Case moved in related to wheel put really the wheel moves, in reversing situation. This opening connected strongly with the case and exhaust pipe for each wheel then connected with the main exhaust pipe, and its specification and angle depending on the calculations of various data. (Det - Fig 4/25)

15. Ignition distributor as known, put the number of contact points is twice the number of power wheel units (depends on cylinder No.s i.e. a triple for three cylinders in a wheel) with the same distribution angle for the whole wheels connected together by one cable and one spark plug for each power wheel unit. The rotating conductor could be(here)two opposite points contact every time.(Det–28Fig 3/25).

The ignition distribution connected with the crank is in a suitable place as rotates by the crankshaft.

For engine of one large wheel with many pistons (cylinders), an ordinary one-point contacted, with the same angle distribution, using one cable for one ignition or two for dual ignition and so on ,could be used easily.

16. The accessories devices :

A cylinder for storing compressed air with a compressor pump, this is working with the engine rotation by a belt to feed the engine with pressured mixture. If a compressor in a vehicle could pump its tire with the high required pressure ,why not using this method to charge pressured mixture to an advanced technology engine. A centrifugal turbine fan connected directly with Crank could be used to supply the pressured air to this cylinder. The charging air supplying to both air-fuel mix and pure air for the chambers. The type of air temperature could be controlled .A mechanical / electrical controlling device of air pressure connected with the accelerator pedal from driver in cabin.

(a better performance than ordinary turbo charger ,although a better modified turbo charger could be used instead which depending on pre-heated and compressed by exhaust gases speed and heat but not in the same efficiency).

The fuel spray injection instrument device to splash it in the compressed air using the simple natural spray principle of a liquid (i.e. acclimatisation)

depending on volatile of the opening and the specific density of fuel. This is the indirect injection way of general charging ofe air while still in its way to chambers, maintaining idle (slow engine workability) by electric needle valves works with ignition by electric device. This could suit for any kinds of fuel. A mechanically or electrically device system, can be supplied as one unit for all engine chamber requirements since its one pressure control accelerator.

A separate pipe-opening regulator for each wheel unit fuel-mix valves requirement with a use of controlling system for automatic engine.(or using independent fuel injection on supplying pipe or store near each chamber valve)

(or using direct chamber fuel injection with its device for each wheel, fixed in the case ,as this could be more complicated device connecting the case).

The charging air could be pre-heated using device with electrical heater or utilising the exhaust emission heat by attached to exhaust gases pipes .

Fuel pipes and fuel pump &Charging (compressed) air pipes should bearing the max. required pressure for engine application with a safety factor . .

(Fig 22/25 & 23/25)

17. The compositions fixing-set up (assembling method) is starting with the crank mounting of all the wheels and pads to be pressed together as the required angles, placing the parts and fixing to the required circular seals on the wheels and trinket them in the grooves on two parts of Case then other accessories.

NOTES/

1. Since this is a new system, I tried to use a simple English language, with some data of the conventional systems components names, however these names (as specified) are not necessarily the standard names of parts in this system.
These names may be changed in the development process according to the final proposals and their relevant industrial standard names, later...
2. All the discussions as for the enclosure drawings which are the references that declare all the compositions typically using Autocad computer programs drawings. (Drawings details are the liable references).
3. Enclosure the typical drawings set of 25 (twenty five) pieces.

USEFUL INDUSTRIAL AND COMMERCIAL CHARACTERISTICS

1. A simple – easy to manufacture and less components parts.
2. High output related to the size and cost, a system contains pistons with rotary operating using exhaust gases aerodynamic potential power advantage.
3. Using a new principle in charging (i.e. compressed air-fuel) the air-fuel mixture to the chamber from out side with any pressure needed for the required performance, not as the old principles which sucking the air-fuel mixture to the chamber and compact it to be in pressured situation by the same piston with its way of losing power stroke and energy. This means using of a jet technique in charging fuel, in this design which will give high performance as fast and better fuel burning as fast rotation engine needs without limits and in relation-with other specifications; it would be a very practical system.
4. The pistons in this engine connected with a flexible push-arm (flexible shaft bar) working as elastic resistance using various resistance types, depending on the power data, occurs in the chamber at firing stroke, (types depending on fuel and output design). This characteristic will apply good specifications, one of them is in reducing the sudden impact and will uniform stress of high power if occur on piston(s), in away that the arm resistance will transfer stresses on pistons uniformly on crank i.e. making the engine more smooth, reducing the vibration. The elastic flexible piston depressing will allow a good flame propagation (as automatically controlled of combustion chamber space), and the same reason to prevent detonation in chambers.

   The other advantage is to store some of it (the stress) to get use of it later (it will charge the piston elastic resistance) to use it in the same purpose i.e. transfers it later too positive reaction. The design will use the stand-still locket gases accrued due to fuel combustion against the piston (in chamber); in away using the stored energy again to use it in the same direction (this happen fast, increase in high speed). The very next situation where the pressured gases (as stored energy) start to penetrate and release free out (in exhaust stork), from the exhaust modified opening; the charged resistance add an extra power on penetrating gases as it starts returning to its first stag; a potential aerodynamic power exist by reversing this power with the elastic assistance of modified exhaust opening, (counter the theory of fly principle as aerodynamic reaction).

The aerodynamic power of the penetration of the chamber's pressured gases from graded specific opening of exhaust; will act against the wheel.

Those analysis conclusions could be confirmed in specialised industrial laboratory using physics, mathematics principles.

These potential powers would act as positive summation resultant reacting on piston causing more power added to combustion gases pressure in chamber to react on piston as additional power effect on wheel rotation.

The centrifugal natural power reacts on pistons (cup) as hunger in the circular zone of rotating wheel; will produce other reaction in high speed.

The potential invisible power could be used with other analysis to minimise the fuel consumption by reaching a special situation between high rotation speed and depressing of piston in combustion instance, using the required resistance and the relations of speed with dimensions and a computer device analysing these criteria's (Fig 18/25).

The natural heat energy advantage (if used) would tight the flexible push-arm of pistons with heat increase especially in using gas, hydraulic resistance, which (expands!) reducing the elastic movement of pistons (increase the resistance) i.e. reduce the sufficient capacity of charging air-fuel mix for the same output later with continuos working time. This special design will agitate (at fuel combustion) this physical nature's powers to appear in a situation magnifying the (best) fuel output power in this engine.

5. The lubrication in large part of it depends on a natural constant principle with a special design that the oil flow will increase with the speed increasing naturally not mechanically (as for conventional engines), it done by a huge centrifugal of the pads by feeding parts inlet oil holes from central tunnel in Crank as with relations to its distance from oil tank at Crank magnifying with speed increase, cooling the wheels and lubricating the pistons. This characters will lead to use the far pad as main oil pump by it special trenches, sucking oil from Crank to supply oil in Case for those seal masses and cooling Case needs in a best way.

   The ordinary oil pump could be concealed if the oil tunnels of case terminate at feeding oil tank of the Crank canal.

6. The pistons with its flexibility arms will reduce the reciprocated movement with minimise decreasingly , (in the distance between upper and lower piston's dead point); du to increasing of the engine speed, due to the design, in a matter

(counters to conventional system's principle-at high speed!); reduce vibrations of the main engine parts movements while increasing speed. The relation of push-arm depressing speed (time) with a rotation speed of the wheel in increasing engine's speed would lead to the equilibrium situation (as assumption) in very fast speed, it is a criteria of reducing chamber expanding combustion space for fuel at explosion; decreasing with speed increasing!

It is the miracle of the circular shape where the centrifugal powers exist in engine. This is a very important character and would be utilised for reducing fuel consumption while increasing speed, using computerised advanced accessories.

7. This engine system does not contains those valves that used in the old engine with their timing articulated connecting system, (camshaft, tapping springs....etc); that valves with its mechanism however will limit the high speed of the engine, which need complicated frictional slippers and accessories as timings systems, which may fail in high speed, as for the modern engines with more valves number for a piston. Those are not existing in this system i.e. delete their problems, noises and air smoke related with any of their defect, although delete their failure which may happen in high speed.
8. The fuel air mix can be controlled easily in this engine form out side accessories, in two ways by controlling the supplying pressure and also by controlling the fuel mixture, or both together, since the system doesn't required the same fuel compression ratio in all wheel chambers or in all its working situations with the independent characteristic of pistons performance and the independent units performance and the flexibility in the engine. Different types of fuel, any gasoline (Benzene)octane with a regulator for fuel splash charger. Jet gasoline or (gas) can be easy used in this system after reconsidering the accessories.
9. Cooling and cleaning of the chambers by outside pressured air (scavenging) directly after hot gases exhausted (stroke). This will control the heat of piston capping and supply perfect adiabatic efficiency of air (heat loss) system for pistons in addition to the wheel side-walls oil cooling (enthalpy) of cylinder bore. The air also will prevent the remain of after burning carbon (soot) and will complete oxidise un-burned fuel and carbon oxide gas (CO) to complete oxidisation it directly to (CO2), same for nitrite oxide (NO), and SO if exist, this is a very practical way in anti-pollution system's treatment, in away to help conserve the good environment and atmospheric ozone and to help prevent acid rain.

When there is no sufficient way or time for cleaning the exhaust gases from the chamber in very high speed ,it is possible to make the control system to delay the ignition for each dual high speed revolution ,without big problem.

10. There is a new way of lubrication for the pistons that only the moving one will be lubricate when it needs to, as each piston has it's own oil pump, and the lubrication system in away that can reduce too much the pollution of air-oil smoke, since no crank case sump bellow the pistons, however no leakage gas affliction on oil sump if this happen.

    There would be an air pad(s) under the piston(s) that could use it's advantage in a special piston design to maintain an almost equal pressure in high temperature in the two sides of piston i.e. on it's seals to be utilised ....for longer maintenance period and for output.

11. The distribution of piston (cylinder) angles against the crank C. L. in the engine will not need a balance weight which existing in recent engine, and their metal bearing slipping pads on crank shaft for stress points lubrications to reduce friction on crank shaft which affected obviously in that system by high speed, those are not required in this engine system: The way of emission gases exhausted with the rotation direction will minimise the stress on seal mass, helping the good lubrication for seals.

12. This new design in distribution of pistons with a unique way in free movements of piston while rotation of the main shaft (torque crank shaft), since the principle used here – will not need to distribute the stress for every combustion (piston) unit, as for the other; all working time, like what happen in the old system which all connected with the crank shaft; each one with (special angle) in slipping point guarded with metal bearing pads, thus all the combustion pistons will move consecutively (mutual) equal in side the cylinders due to the rotation of the crank shaft, all the time, and will increase with speed ascending causing much friction, lubrication, heat and vibration, which affect the engine efficiency. This new design system reduces piston movement (descending) with increasing of speed rotations; due to spring flexibility (elastic) system reducing: the friction, heat, vibrations noise and, even it can reduce the fuel consumption. Using very advanced controller systems from outside depending on the harmony, hydraulic movement of pistons which will reduce in high speed.

13. The best seen character for this engine is the multi-output powers which can be changed in various ranges not even depending on the rotation speed of the engine but on the working parts inside the engine (automatically power output).
Like for example all parts in used supplying 100% output of the engine for heavy work in a car engine, or 2/3 or less of parts in used for high speed or 1/3 or less of parts in used for just to keep the engine in Ideal working situation, this could be done in away that even its services (for un-used wheel); could be stopped.
This character is very useful: in fuel consumption, in reducing pollution, in long maintenance, this new engine can be produced as engine for every work (multi-purpose) in one equipment (i.e. one car) which is automatically control output as required, without affecting on un-used parts or makes tough vibration.
SHIRWO Automatical Need engine will be called Shirw a,n ...(SHIRWAN) system { automatical energy need}.
The transmission gear complex in this engine could be minimised.
14. Since there is the ability of stopping some of piston's movements (or all) in this design with the continue of rotation of the crank, the engine can be combined with an electric power engine in the same crank in an advanced design with a very practical use (fuel combustion engine and electric power engine in one unit set) depending on the simplicity design and minimum torque loss of this new engine which can charge the electric battery when the combustion engine working, and can use the electric power engine directly instead – if it needs; at required situations as needs in a crowded city, to reduce the pollution.
15. In addition to other characters and proposals which can be obtained in industrial laboratories this machine will fill the gap between the normal pistons combustion engine – and turbine Jet engine using their-all-good characteristics together in one engine, it will use the good characters of combustion piston (rotary) engine in economic fuel consumption, slow rotation speed if required, small engine and easy to manufacture and maintenance, with the Jet characteristics of high power, high rotation speed if required using the aerodynamic power of exhaust gas with other potential powers; in an advanced designed and cheap engine unit.
16. This design will open the wide gate for the computer participation in controlling all the activities and performance characteristics using advanced controller's accessories in this system at the near future. The speedy efficiency of the this

engine and its good characters, which will give this engine a great economic influence.

17. This engine could work in vertical direction related to the torque crank ,since all the engine main services depend on the centrifugal principal .

The very important characteristic and the ways of reducing(decreasing) fuel consumption rapidly with high speed increase .The analysis will leads to use it mainly in high speed that causing less reciprocating piston movement in engine, which makes it very qualified engines for Hoover Craft or flying equipment. A promising generation of combustion system will appear in this 21st century, to be used for advanced small Hoover craft (or a composite vehicle of Automobile and Hoover Craft)by implying this cheep system with advanced computer controlled running and flying- transportation equipment.

more advanced research on it will continue, for an example the Laser ignition may be used in its ignition due to its high speed ....!

17. The fabrication of the extensive and various options of this engine design could be implied easily ,when the main elastic parts of this system could be used from those elastic devices springs or else used in the automatic emission re-fill weapon , the different machine-gun and fast-canons ,i.e. those weapon industries could transfer a good part of their industries to participate in producing these engines for civil and peace purposes...!.

ENGINE POWER OUTPUT TYPICAL PERFORMANCE

As for (drawing) Fig 19/25

1. The engine starts to rotate by a starter motor-accessory fixed near an end side of the engine, by a starter switch for few seconds.
2. All the inside parts will rotate, the valves start its work due to the automatic system of controlling its gate opening a giants each chamber in power unit wheels feeding the air-fuel mix, controlled by accelerator of driver pedal and its normal (idle) minimum working feeder; to the first chamber by opened the valve gate at the same time with the timing duration's of the cooling (lubrication) pads by its connected taping bar. The air fuel mix will enter the first chamber over the piston and the continuing of rotate will take this chamber filled with (compressed) air fuel mix in a place opposite the spark plug.

*(as suction stork in old system) ...here {fuel charging zone}

3. The chamber will be filled with compressed air fuel mix that maintain in pressured situation since the chamber locked by Case wall and piston and gas mass seals from two sides in circular wheel surfaces back side Case wall.

   The position of seal masses on wheel circumference will keep it locket.

   When the chamber placed opposite to the spark plug, air-fuel mix instantaneously sparked by ignition timing distributor, and will explode to gases, due to fuel mix fast burning. A production gases which need to expand to their natural large volume, in closet space; causing high pressure power on surrounded walls and piston which has the flexibility of start moving depressing due to its special spring connector inside the cylinder base, causing stress on the spring in the best typical way, by power stress due to gasses to piston then depressing then charges energy to the spring (elastic) system.

*(firing stroke)...old system..................starting power stroke.

{firing stroke} in this system ....start power zone

When the piston stress the spring system, the spring will transfer a part of this stress to the cylinder base (wheel side), causing rotation of the wheel, and the rest of that stress on spring will be stored as charged resistance assist to magnify the rotation power later at beginning of the exhaust graded opening to maximise the aerodynamic reaction on wheel rotation (this is the power duty of spring elastic power system here).

4. Apart of stress on the cylinder base caused by spring on side of wheel centre will push the wheel to rotate depending on this part of reaction of gasses pressure in the chamber due to pressured air-fuel mix fast burn, which will happen in other unit in succession.

   *(expansion power stroke).....with enthalpy (old system)

   {expansion power stroke – 1st power zone).....with enthalpy (Shirwo system)

   Thus the firing stork will finished by burning all the mix then put off; producing potential stored energy (as gases in high pressure) before reaching the last big seal mass which fixed in suitable designed place.....criteria.

5. Due to the rotation of this (wheel), the chamber will reach the graded exhaust opening i.e. enlarging trench(s) with rotation direction, the already lifted gases which still in high pressure inside the chamber (as the piston in depressed position), new compound stresses in this place due to many potential powers take place.

* (moving up starting – exhaust stroke-end power stroke) lose power ...with enthalpy

{starting exhaust-return back release – 2nd power zone} extra power ...with enthalpy

6. The compound stresses that all react positively on wheel rotation are :

   1st in time of gases start to penetrate from the graded exhaust opening – and due to star loosing of gases pressure in chamber the already compressed spring system (elastic system) which has been charged (or partial) by stored energy already produced in chamber before; will start rapidly to return to it's first position (normal situation) pushing the piston upward again, that will push also the remaining gases still not manage to penetrate to escape faster this case will cause potential reactions on the wheel the spring system in getting it first loosing situation will react in two direction i.e. on cylinder base means on the wheel when gases start escape.....(spherical reaction),

   2nd the stored energy of spring (resistance) will attempt to be free causing power on gases (against piston) in chamber and due to circular Case back wall (chamber wall), and the uniform pressure gas physical character of chamber gas pad (still semi-locket chamber) that will counters the reaction; the potential resultant force will be the positive summation reacts of one direction on piston which is provide another additional power rotating the wheel in the same direction (spherical react).

   3rd the locked pressured gases which start to penetrate when reach particular wide of exhaust graded opening will discharge fast cause Aerodynamic

movement to put the chamber (i.e. cylinder i.e. wheel) in a place that all gases manage to escape faster which cause the wheel to get extra power for rotation by law of fast air principle (as the air plane flying principal put in reveres analysis)

* (upward dead point) reduce Enthalpy high degree Entropy with Body cooler only. {release total power} reduce Enthalpy low degree Entropy with Air scavenging & Body cooler (end of power zone).

And so in this place the stress summation will affect on the wheel and this a semi opened position i.e. the effecting of stress on the parts (near by) will be less since the explosion of the air fuel mix already finished before in a chamber alone far from valves.

Same operation will be happened with the nearest wheel chamber (by angle radian distance) consecutively and the rotation movement will continue.

7. When the gases manage to escape with the rotate of the wheel. The chamber will reach at the end of the exhaust opening to the pure compressed air valve which opens due to the rotation of the cooling pad tapping timing bar; against the chamber, permits a fast pure air cleaning (pure air scavenging) the chamber from what left to the gases to exit before the chamber leave the exhaust opening totally in ending the tacking cases due to the remaining carbon optical which may occur after burning the fuel mix and this way of cleaning the chamber by air has a great effect in deducing the pollution of un–oxidised hot gases. After fuel mix burning to treat them while still heat and will minimise the creation of carbon oxide gas element. The pressure of this pureed air will exceed with rotation speed increase. So the chamber will kept always in suitable temperature.

* (move downward dead point-suction stroke) high d. Entropy ..lose power due to friction {natural stage – air cooling, cleaning} ...low d. Entropy ...no power lose !!

* (move upward dead point-compression stroke) ...H.D. Entropy ...loss power.

End of power zone (shirwo engine)....lower entropy with air cooling, no power lose.

An example of one power stroke in each half cycle (here) at each wheel bearing part (wheel zone!) **on crankshaft.**

8. In increasing speed of this system, the radian rotation velocity of the wheel would become near to equalise with pistons push-arm (resistance) depression's velocity, depending on the elastic resistance (push-arm) data characteristic.

This means the expanding space of chamber will be deduced (for the said required engine power) by increasing speed, a mathematics criteria with fuel compression rate: speed, resistance depress, fuel, dimensions, will conclude to reduce fuel in increasing speed.

In high speed also, the reaction of the nature's centrifugal power will appear at combustion stroke (power stroke) stage, it is acting on piston as its location being in the circumference of a rotating circle with freedom to be pushed out of it (in its moving zone) modifying the piston depressing resistant with this potential power but due to gas pad in (locket chamber after combustion happened).Although existence of Case circular back wall (chamber back wall); that keeping the chamber in radian move maintaining the same uniform pressure in the chamber (due to this design and seal places) .This pressure with gas physical character that revoke (reflect) as a balloon any power reaction on piston (fuel combustion energy , the mass movement of piston; Newton law) magnifying fuel combustion energy on engine i.e. reducing the expanding of chamber to the said fuel, means reducing of engine fuel requirement for the said power in increasing speed i.e. an extra criteria of reducing fuel consumption in increasing speed. (Fig 19/25).

The performance accessories which help this engine to work are:

(Fig21/25& 22/25),

A. The compressed air cylinder with its charging(compressor) motor that gets its rotation power from the engine by a belt which keeps the air in sufficient pressure. Discharging it to the main pipe which guarded by a controller regulator by secretor-bar from driving cabin which is always in closet state when engine out of work, electrically. To open when ignition starting with the slowly -run regulator. The open device to the pipes one for (fuel mix) to fuel spray for whole power wheel units or to separated fuel spray system for each power wheel unit to be electric controlled (computer system) from the driver cabin. The other pipe device for pure compressed air to the (cleaning) cooling air valve.

B. The fuel spray system is a mechanical-electrical instrument device with needle valves which uses a simple principle of letting the fast air passing on small outlet opening of fuel to produce spray in this air as required depending on Specific Density of fuel which maintain in supplied by ordinary fuel pump (mech. or elect.).

C. The necessary pressured air will increase due to driver paddle-managing system controlling the speed of engine's rotation and torque power.

D. The other accessories like oil pump and water pump and ignition distributor will rotate with the crank or as for the industrial design.

The overall work of power wheel units (all) output with a remarkable rotation speed or remarkable pressure for charging fuel will supply and monitoring the output power of the engine, that could be modified by various applications.

CONCLUSION :

The maximum fuel power output that occur due to a larger piston moment on Crank, than that of recent system, with the effective angle of torque power more than 180 degree (depend on the design).

After the instance of fuel combustion in this mechanical design system, Physical power(s) will happen due to the particular distribution places of chambers with the utilisation of the physical character advantage of gas (under pressure chamber gases) that occurred after combustion, although utilise physical powers that happened in other particular places and situations.

1. Under pressure gases impact on piston, the physical power of elastic character (flexible push-arm), would act on two ways, a part pressing the wheel to rotate, and other on piston to get back to its top point (upward dead point), due to the resistance of push-arm that already depressed by the piston i.e. chamber's combustion gases. It is gas physical character in I locked space, which could reveres (reflect) any force as elastic resistance to an opposite reaction which will be back again on piston. Since the back side of chamber was the case wall (internal circumference of circular wheel cavity), which is the only sway moving smooth level with (constant fixed axes), chamber stills in locket situation by seals Job; while the wheel rotates means keeping locket chamber in fuel firing zone,. This is the appearance of hydraulic (spherical) reactions of chamber gases.

   There will be many advantages in utilising this chamber (gas pad) hydraulic characteristic in this mechanical system to invest all powers happen inside this system positively on engine Crank.

2. A losing of pressure due to gases penetration when gases start to penetrate due wheel rotate reach the exhaust opening, will agitate the last static elastic physical

power on elastic piston push-arm (after first dressing attending to return back rapidly to its normal position on two direction (sides) of reaction, meaning on wheel also to act with addition power for rotation.

3. After the continuity of that powers effect. A new physical power happen after instance due to the way of exhaust wings opening's design .That allow the under-pressured gases to extending partially then totally penetrating in away to get their fast best position of escaping from chamber. With the advantage of existing access power from the piston push-arm resistance being under press that attend to return to its normal (first) position .A Physical power which is the Aerodynamic that forces the chamber to be at the right position (portion) when gas escape. Which will cause additional rotating power on the cylinder i.e. wheel to rotate depending on its place and on the exhaust opening place in this design. By the mean of using the same principal analysis mentioned, that produces aerodynamic power by using the air speed principle (a flying principle put in a reverse way of reaction analysis).

4. In increasing of engine speed (i.e. rotation speed) a new physical power will appear, instantaneously at the time or fuel combustion.

   The piston mass (cup) will be under the force of the physical Centrifugal principle due to its location in circular wheel and its mass-weight since it can move freely (even the mass of chamber gases).This means adding more potential power to the push-arm resistant. That will act on the piston against extension of the chamber due to fuel combustion power. This reaction which transpires to pressured gases which are in a locked space in the chamber with the advantage of gases physical characteristic being under pressure (after fuel combustion). The gas (referred to pressured gas characteristic in a closet space) will reverse (reflect) this power to be opposite to piston face (i.e. same depressing direction) adding additional power i.e. additional power on wheel. Those main the said fuel demand for this situation of engine speed; could be reduced rapidly while reaching this speed and so on . (Fig 18/25).

   This with other criteria concerning the speed of push-arm depressing formula against the combustion force .A relation to wheel rotation speed which may reach theoretically an semi equilibrium situation in highly speed, between the reciprocated linear movement of pistons while increasing engine speed.

That depends on type of fuel (after burning gases compression) and kind of the resistance used with a relation to centrifugal effect on that piston cup, all analysis could be concluded with the output and speed.

Mathematical conclusions for various design proposals for reducing fuel consumption in increasing the speed could be reached. Using the advanced conclusion of beyond earth anti-gravity flying principal i.e. space technique of how to allow a space-ship to free from Earth gravity intensity zone by using the speed and centrifugal principle. This system uses this principal inside the engine in a small sample but will reverse (counter) this principal, by reversing its force. The piston to be assumed (fixed) space-ship and the wheel as (Earth) while increasing its speed. It is free to rotate (more), and the re-product of gases under-pressure (due to fuel combustion) in chamber acting instantaneously as more power of speed to escape from gravity (of Earth),i.e. the reaction of centrifugal will reverse here to act on the wheel rotation positively again.

An advanced computerised controlling system using the conclusion of that calculations for a piston weight, a wheel diameter, type of piston push-arm resistance, fuel output, kind of equipment ,the load and speed; to set a controlling system for reducing the fuel by connecting it with the air-fuel charging accessories devices to control fuel as it required then reducing the consumption in increasing speed.

This is the advanced way of reducing the fuel consumption while increasing speed !

IN GLOSSARY (Philosophy of this technique):

This system is utilising the theory, which used in charging water or any liquid by principal of a """Centrifugal Pump or centrifugal compressor""" rotated by power supplied from outside automotive resource . (Fig 18/25)

Using the same theory for mechanical design but in a counter way of reaction. Since the liquid used in place here is that charged with power charged liquid 8easy chemical energy analyses) that is fuel spray form Petrol. Which is been used in a discipline that could produce energy force inside this system then making this energy act in a way (i.e. reverse direction on that centrifugal pump system) to make it rotate as automotive power engine, while using the same

principle of reaction which is centrifugal (high speed reaction on a mass moving in a circular zone) to utilise this character on pistons-mass and assumed expanded gas mass) as for their particular circular-zone places in this system for producing torque power then could used in reducing the fuel needs for said speeds (that can be seen in high speed) while increasing speed!

The performance of the engine depends on many constant assumptions and the proposed observations of its work here without any mathematics figures since those information depend on the industrial specifications, laboratories calculations, kinds of allays, types of equipment, the capacity of output, fuel and accessories data.

For that reason the definitions are theoretically the principal of performance and could be practically proposed after monitoring the data in specialised industrial laboratories in order to reach the most economic design for each case and proposal.

Note:

Mathematical analyses might be done in specialised industrial laboratory at development process later using the recent requirement data available for proposals.

SPECIFIC PROPOSALS:

1. Light solid allows for power wheel unit might be reinforced by hard solid steel in torque stress places (i.e. middle panel of wheel, crank trunk hole between the cylinders, cylinder bases and wheel circumference as one alloy).
2. Light solid alloys for piston's disk as required.
3. The push-arm resistance capacity for piston must depend on type of: engine output, speed of acceleration, working output, type of design, dimensions...etc. The temperature resistance flexible metal spring system (i.e. that used in weapon industries as for automatic artillery gun refill spring) or : hydraulic closed system (gas, oil) with heat resistance seals may all used for piston elastic push-arm.
4. For main gas seal mass: a self-lubricated Graphite alloy or hard metal alloy with special lubrication system in the engine case using the advantage of one direction wheel rotation with special trenches and holes, or advanced plastic solid combined material with anti-heat character; the type, shapes and sizes

might be varied from different industrial resources; for minimum sufficient contact. Three types of seal mass, one for anti normal air, one for anti air-fuel mixture, one for anti-hot gases after combustion occurred before exhaust penetration. The same principal for all or use couple of seals for two-way efficiency i.e. opposite locket reaction in one seal mass unit. Wangle seal could be used in each seal mass unit i.e. not in rotary part here but in the case with more efficiency, workability since it used in fixed place (fixed axes) i.e. maintaining a fixed axial position for the wheel surface contact here.

5. The big circular seals & wheel with Case sliding are of three or more stainless steel ring bladder inter lock gathered as a slide bearing ring device or couple as industrial required or special wheel's edges with sharp design inter look with engine Case; with a technique for anti-oil-gas penetration when combustion happen depend on design proposals (Fig 2/25 & 3/25).
6. Oil, gas, rings seals in pistons as specified metals for this work.
7. Lubrication pads light aluminium alloy with special radius groves for oil cooling and special smooth hard alloy smooth edge for controlling timing of valves-bars with chambers positions, the timing regulation for each valve in one pad or each in a pad, the timing depends on the design data & requirements.
8. Oil is used for lubrication & cooling the power wheel units this oil could be cooled by water or air cooling system in the engine unit or out side.
9. The distributions of cooling water groves in Case are as for industrial design for cooling Case and oil.

DESIGN PROPOSALS:

1. This engine can contain many power wheel units depending on the out put torque power, with a relation to the diameter and number of cylinders in each wheel, the various proposals and options of this system provide a diverse use for it.
2. The power wheel units could be in different diameter for engines, the principle of piston's moment effect on Crank will be considered in related to output power using the required wheel, cylinder diameter in any engine design.
   Although the ability of controlling power units performance; as (Shirwan engine). (Fig 2/25, 17/25 & 21/25, 22/25)
3. Double ignition systems (accessories) in one large (super) power wheel unite one or more in engine, simply could be used. (Fig 24/25)

4. The main tunnel (canal) for oil supply in the crank can be out side the crank by special connected parts on all the rotating parts on crank with longitudinal line holes as tunnel (canal) a cross all parts (that stickmen together) parallel with shaft line, in its boundary, with its holes for each oil feeding requirement with regard to balance rotation system.
5. The water can be used for cooling Power wheel units walls by special design for Case in extensions between the wheel units contain canals for water cooling the oil and near the wheel side-walls.
6. The difference of cylinder number in wheels with their accessories required depends on speed and output power of the engine; (Fig 14/25)
7. The cylinders in each power wheel unit in the same engine could be in various diameters than the other wheel with special accessories as required for Automatic power engine (Shirwan) engine...(Fig 15/25).
8. The use of different wheel diameter in one multi purposes engine; with special accessories as required, for Automatic (multi) power engine; (Shirwan) engine. Auto-Engine (Fig 16/25)
9. The fuel spray system can be one set for all air-fuel mix, or can be separated for each power wheel units in the engine controlled by advanced computer systems, as required for Automatic power; (Shirwan) engine (Fig 21/25, 22/25).
   The pre mixed fuel injection (indirect) for charging valves, which used her, can be substitute by direct injection on chambers by Case fixed device for each wheel.
10. The fuel spray system can be controlled by computer system to maintain the required spry mixture with air and could vary this mix for each type of gasoline octane content by automatically device as required.
11. The places of the big gas mass seals can be changes depending on the design data; the type and way of work depend on the type of industrial production.
12. The exhaust opening could be in different grade openings and angles related to engine design and fuel criteria and could be mechanically changeable control!
13. The flexible (elastic) system of piston push-arms could be of various types for different engine designs (or even different in one advanced automatic, engine) using metal spring, gas or oil hydraulic device - heat resistance – like those used in automatic gun weapons, it might be more tight and modified by heat increasing!
14. An advanced new modified system under the name of (connected hydraulic wheel unite system) could be used, that can get use of the impact power on piston at

the firing stroke instantaneously to transfer apart of this power to opposite direction affects on the other piston in the same wheel at a position; when its combustion gases (in previous action) start to loose from exhaust opening, in a way to supply an impact press from inside (cylinder) to push piston outward pressing on those gases, in chamber, accelerate hem to fast release from graded opening, which will create reaction on opposite direction increase torque with additional power on wheel, this technique of connecting resistant system of two pistons in one wheel in a very advanced modified system as a part of this development researches as many other patents included in this system. (Fig 12/25).

15. The ordinary oil pump can be concealed in the engine if a special design for the oil tunnel in Case directed oil to the feeder tank for central oil tunnel in the engine crank. The oil will naturally flow due to rotation of a huge natural centrifugal oil pump(s) of cooling-lubrication pads which radian grooved in a required way (especially the last pad).
16. The ignition distribution can be in advanced electric design. It might need additional timing device as for old system but with more simple method, and even can use the electronic computerised device due to the fast rotation of engine as one part of computer system research of this patent.
17. The metal industry for wheel allies, its grooves and tunnels can be easy done with facilities of metal and casting drillings available in recent manufacturer. (Fig 9/25)
18. This engine could be design for vertical crankshaft direction with the same principal of this system to be used for Hoover craft and flying equipment.

THE DRAWINGS CONTENTS

Important note:

The drawing are assumed in typical (assumed) dimensions for A2 size drawings in Autocad diskette program to declare the composition of engine but not the same scale for A4 although not necessarily for industrial design requires.

FIG No (DWG No),

1/25 (1) : GENERAL SHAPE

2/25 (2) : TYPICAL POWER WHEEL UNITS IN ENGINE HORZONTAL SEC.

3/25 (3) : TYPICAL POWER WHEEL UNITS IN ENGINE VERTICAL SEC.

4/25 (4) : TYPICAL SPRING MODIFIED CROSS SEC.

5/25 (5) : TYPICAL THREE-POWER WHEEL UNITS SECTION PLAN

6/25 (6) : TYPICAL POWER WHEEL UNIT OIL CANALS ANALYSIS

7/25 (7) : TYPICAL COOLING, LUBRICAITON PAD

8/25 (8) : TYPICAL PISTON ANALYSIS

9/25 (9) : TYPICAL ENGINE PARTS

10/25 (10): TYPICAL DIMENSION OF POWER WHEEL UNIT

11/25 (11): PISTON PUSH-ARM MODIFICATION

12/25 (12): DUAL CONNECTED PUSH-ARM OF PISTON

13/25 (13): VARIOUS PROPOSALS

14/25 (14): VARIOUS CYLINDERS IN A WHEEL

15/25.(15): VARIOUS PISTONS DIAMETERS ENGINE

16/25 (16): VARIOUS WHEELS DIAMETRES ENGINE

17/25 (17): FOUR-POWER WHEEL UNITS ENGINE

18/25 (18): FORCES ANALYSIS

19/25 (19): TYPICAL ENGINE PERFORMENCE

20/25 (20): A PROPOSAL FOR SEAL-MASS DESIGN

21/25 (21): TYPICAL ENGINE ACCESSORIES PROPOSAL 1

22/25 (22): TYPICAL ENGINE ACCESSORIES PROPOSAL 2

23/25 (23):A TYPICAL ENGINE FOR FLYING EQT- VERTICAL CRANK SHAFT

24/25 (24): A TYPICAL ENGINE FOR A WIDE WHEEL

25/25 (25): DETAILS OF ENGINE DRAWINGS

DRAWING DETAILS – DECLARATIONS...(ALL THE DRAWINGS)

1. Chamber (combustion room).
2. Case (engine Chassis).
3. Wheel (Power wheel unite - energy unit).
4. Anti-scratched alloy (modified wheel surface).
5. Metal spring (straight or inclined).
6. Crank (power-torque crankshaft).
7. Piston push-arm (flexible shaft device).
8. Piston push-arm base. (cylinder base).
9. Spark plug.
10. Piston lubrication pump (built in, not as scale of drawing).
11. Oil tunnel (canal) for piston lubrication feeder.
12. Bolts for fixing seal base (in Case).
13. Pinion ring to transfer rotation to other device (for ignition...etc).
14. Solid steel ring for piston locks (in cylinder).
15. Canal in case for oil system (flow back).
16. Regulator adjustment for big seal mass.
17. Pad for cooling & lubrication.
18. Ring seals in piston.
19. Big seal mass in Case (anti-gas).
20. Air-fuel mixture-chagrin's system (pre mixed fuel injection).
21. Pressured pure air (scavenging of chamber); charting's system.
22. Valve (one way- air check valve).
23. Canal of water's cooling system in Case.
24. Central oil's main supply canal.
25. Engine base flexible holder.
26. Big circular wheel oil seal, wheel slide-bearing (anti-gas, anti-oil).
27. Ball bearing device.
28. Oil pump (for engine).
29. Water pump.
30. Exhaust aerodynamic special opening.
31. Cladding perforated hollow pipe.

32. **Main assembling bolts for Case.**
33. **Ignition distributor.**
34. **Feeder oil tank for engine.**
35. **Oil sump.**
36. **Oil pump intake.**
37. **Oil supplies pipe.**
38. **Oil refill opening.**
39. **Oil lock washer.**
40. **Tightening ring (washer with pin).**

THE CLAIMS ON THIS INVENTION :

(Referring to the drawings Fig 1/25 to Fig 25/25 and the description)

1. The design of this engine : An engine comprising from a cylindrical case having at least a wheel(s) (i.e. flywheel) mounted coaxially on a straight (crank)shaft inside the cylindrical case for rotation therein. The said wheel(s) containing at least one cylinder in centre-side perpendicular to the axis, in which it is opened from one side to the inside circumferential surface of the case cavity. A piston mounted inside the cylinder which has the ability of linear movement therein. The piston top together with the cylinder wall (bore) and inner circumferential surface of the case defining a combustion chamber. The piston being mounted to the closed end of the cylinder via a flexible **free** elastic push-arm. Seals mounted with the case meaning around the circumference of the wheel along the edge at each side, as well as at three or more radial locations guarded the mode of stroke situation zone during the work of the engine. The wheel supplied with fuel mixture inlet(s), spark plug(s) exhaust pipe(s) and air supply inlet(s) mounted in the case. In the end of exhaust stroke there is a valve feeding air in the right time on the chamber to scavenging and cleaning hot exhaust gases to cool the chamber. While these gases expelled via a specific aerodynamic opening mounted in the case. The pre-compressed air-fuel mixture charged (fed) into the chamber(s) from outside by inlet valve away from firing stroke zone, using required accessories (pressured gas cylinder, pipes and fuel spraying device all controlled by mechanical or computer system). The lubrication and cooling services working depending on the centrifugal principal by discharging oil from the main central canal inside the shaft length to engine parts via holes then to outsider case. The oil servicing for piston wall using a rod pump mounted in its push-arm connecting piston with oil intake, working related to its linear movement, sucking oil from the central oil canal . Then ended to wheel side-wall. The wheel has oil cooling pad in each side, fed from central oil canal ,collecting oil from piston(s) then to direct oil by radial grooves to the outsider case. Oil cooled in the case while directed to the oil tank in an engine end, which connected again to the central canal. Where more than one wheel inside the case each wheel could work separately with its independent fuel and air feeding accessories by controlling devises from out side.

2. The engine characterised as in claim 1 , the said engine is using combination of piston principle, rotary principle and a turbine principle in additional to utilising physical affections due to the specific movement of the engine parts in performance to act all positively to add extra powers of these energies on engine output torque i.e. magnifying the power of the said fuel.

3. The engine characterised as in claims 1,2, the said engine is using the principle of injecting pre-compressed air-fuel mixture as used in the Jet system but it is vertically on the axis of a specific wheel(s) contains piston(s) of free elastic push-arm, to work similar as a turbine. By utilising all reaction powers of fuel-mix combustion in its chamber(s) for output. This engine has the good characteristics of piston system as easily controlled with fuel economic and the turbine Jet system of speedy powerful output. The said engine would stand as the bridge on that wide gap between piston system and turbine jet system.

4. The engine characterised as in claims 1,2,3, the said engine does not have energy-loss stroke. Any piston(s) performs in the wheel with various power stroke reactions in one cycle to act all positively on the same wheel zone of the torque shaft during the work .

5. The engine characterised as in claims 1,2,3,4, this engine is using the advantage of the potential aerodynamic reactions of the exhaust gases to add more output power to the engine thus the exhaust specific opening could be in a fixed place or/and controlled places adjustment by a regulator in this engine.

6. The engine characterised as in claims 1,2,3,4,5, this engine is using the pre-compressed air-fuel mixture to feed i.e. to charge (to inject) the chambers of the engine via outside accessories. For a better combustion efficiency in squeezing more power in this modified discipline spark engine which designed to bear the various powerful mixture output , safely.

7. The engine characterised as in claims 1,to,6, this engine is using a separate system for air-fuel mixture feeding valves for each wheel or part of. The perfect performance of this discipline, due to relevant timing controlling mechanism against each chamber and their places in a portion away from firing stroke.

8. The engine characterised as in claims 1,to,7, this engine is using the principle of charging(injecting) pressured pure air on the hot piston(s) cup i.e. to the chamber directly for scavenging the exhaust gases , cooling and cleaning the chamber, during ending of exhaust stroke .Its good adiabatic affection, the

good expelling of these gases with what could be left of the soot. This could be controlled by a regulator to control the pressure and the temperature .The wheel feeding and ignition could be delayed - in highly speed - to perform for each two revolutions automatically in order to let this procedure works perfectly

9. The engine characterised as in claims 1,to 8, this engine is using a built-in system designed to reduce pollution within the engine discipline by using pressured air injected directly to the hot gases in the chambers while still hot at the end of exhaust stroke. Which will complete the oxidisation of all exhausted gases i.e. CO & NO-x (and SO-x if exist) to be in friendlier status for the environment ,preventing acid rain .This could be controlled by a regulator even away of adding the elements assisting in completing anti-pollution procedure.

10. The engine characterised as in claims 1,to 9, this engine using flexible elastic piston push-arm with free movement , which provide a good efficiency for any fuel combustion factor, even for any mix rate (different compression affect) to act on torque crank positively without losing energy. It is a way of maintaining the perfect fuel combustion in chambers, by using the flexible chamber space extending due to free elastic piston push arm. Keeping the required chamber space for a perfect fuel combustion. Keeping the best firing situation for any mixture compression reaction for each fuel regardless of fuel efficiency i.e. benzene octane ...(or fuel mix rate). However the discipline of this system will maintain all resultant energy to be transferred positively on the Crank. *Terminating knocking, rumbling problems, those exist in recent conventional engines .This engine is using a principle of free flexibility in transferring fuel combustion energy in the pistons to torque power on the crank since engine's pistons are not guided by a mechanical connection .This will provide a powerful and fast acceleration performance with the harmonic affection on engine parts.*

11. The engine characterised as in claims 1,to 10, this engine is using easy way of charging the air-fuel mix separately to each power unit as the ideal requirement by a mechanical control of simple unique pr-designed spraying device .Or by using a computer control of the multi-spraying devices for the automatic feeding requirements to each power wheel unit (energy unit) for the multi-power output engine by a wide participation of a computer in this engine.

12. The engine characterised as in claims 1,to 11, this engine is using a principle of central oil supply tunnel (canal) for lubrications and for cooling operations depending on this engine discipline by utilising the Physical Centrifugal principal of engine rotation. Its good efficiency related to the speed. The oil sump (tank) will be far from the pistons bases e.g. far from combustion hot gases affection if any leakage happened from the chambers.
13. The engine characterised as in claims 1,to 12, this engine is using an independent piston's lubrication device of rod-pump working related to piston's movement. that supplying oil to wall of piston as its movement demands (for piston's wall in the cylinder as it required), separately each by its private pump.
14. The engine characterised as in claims 1,to 13, this engine is using wheel units in transferring combustion energy smoothly to torque by flexible reaction parts without bearing stresses parts with high frictional factor, such energy loss due to neglecting the physical dynamic reactions are not existing here due to this slice and simple mechanism as this considering the power-weight ratio criteria.
15. The engine characterised as in claims 1,to 14, this engine is using a practical way of reducing fuel consumption ,by the capability of maintaining the exact required working pistons need for any type of engine application, to be for the sufficient performance that needed for the work's demand, by using the required feeding controlled from out side ,on the accessories for this purpose.
16. The engine characterised as in claims 1,to 15, this engine has the ability of the multi-output performances. Its ability of controlling any piston performance. Any piston could work or terminate as required during engine rotation, despite they are all on the same crank. This could be happened without influencing on other parts in the engine, related to the engine design concerning the multi-numbers of pistons , wheels and control of the accessories . This is because of the independent piston performance without guided by a mechanical management which leads to automatic performance, i.e. The Auto Engine .
17. The engine characterised as in claims 1,to 16, this engine is using a design of the free flexible elastic push-arm pistons ,with chambers places moving in a wheel circumference .Providing the advantages of the physical characteristics of this magic circular shape .In reducing the linear movement of working pistons in the same rotary direction inside this circle. The piston's depress

decreases with the increase of revolution speed . The physical concept of circular acceleration by its same direction linear force reaction.. A conclusion equations could be introduced to reduce the fuel needs in highly speeds due to approaching a situation of the minimum piston linear movement i.e. minimum chamber(s) expanding .Its graphical curves could be used to program the feeding controlling system for this criteria. In order to reduce the fuel mixture needs for the smaller chamber(s) expansion, rapidly. It means this system countering the said fuel consumption in increasing speed by a physical effect .

18. The engine characterised as in claims 1,to 17, this engine is using the principle of utilising the Centrifugal principal in highly speed, to reduce the fuel consumption .This is connected with the circular placing of the chambers with free movement of the pistons related with the weight of piston masses and an assumption mass for the gases in these chambers. Keeping the same reaction on the wheel(s), at these high various revolution speeds .This physical reaction will be reflected by gas pad in the chamber(s) to act on the same positive direction. This means extra descending in the said fuel consumption with speed increase for in this engine.

It means this system is also countering the fuel consumption when increasing the speed by utilising this Physical Dynamic Principal of Centrifugal.

19. The engine characterised as in claims 1,to 18, this engine is using independent valves and could be controlled separately without using that articulated timing connection, e.g. cam-shaft. This engine is also substituting the slipping bearing pads that exist in rotating parts under stress, by chambers gas pads which are in the circular zone moving contacting the case.

20. The engine characterised as in claims 1, to19, this engine could use various ways of regulating and adjusting of almost all engine activities, i.e. controlling fuel consumption, oil-cooling system, output power, pollution treatment quality, the pre-heating of the engine ,the use of aerodynamic power in output and the termination of the defected piston. All these could be done by a computer.

The way of radian (stroke) seal mass contacts on the wheel circumference could be controlled mechanically or by thermal adjustment with relation to engine speed or engine heat or where to be used as required for any wheel in performance in the auto-engine i.e. from out side by controlling device.

21. The engine characterised as in claims 1,to 20, this engine could be modified easily for various kind of power output, when keeping the same general dimensions. By changing the elastic push-arm for the pistons only . With little changes in the fuel mixture feeding device. This because of the circular effect of the engine discipline that could bear different power mods without problem.
22. The engine characterised as in claims 1,to 21, this engine could use various proposals for manufacturing depending on this design principal as different in: power wheel numbers or diameters, cylinders diameters or cylinder (piston) numbers in each wheel, or even deferent dimensions of all these in one engine for the wide auto engine application .A connected hydraulic system for a two pistons in one wheel could be used also to exceed the expel of exhaust gases more rapidly. A metal spring of differential diameter could use in the push-arm.
23. The engine characterised as in claims 1,to 22 this engine could be used vertically in regards to the shaft (crank) direction as a vertical engine performance that because the oil services here do not depend on the earth gravity, They depend mainly on the centrifugal principal .The speedy efficient power output could make it easily to be used in Hoover craft and flying app.(Fig 23/25).Also wheels could be mounted in opposite exhaust openning.
24. The engine characterised as in claims 1,to 23 this engine could use as dual or more ignition spark plugs in big diameters wheels depending on the same design principal considering the radian seals distances of the stroke situation , the exhausts opening , the ignition distributor and the valves mechanism.
25. The engine characterised as in claims 1,to24 , this engine could be used as a group on one or connected shaft (crank), to work for one of variety heavy application, as deferent-power engines each engine could have its own oil services and controlling system to work or stop without influencing on the others .That is because of the smooth-slice rotary design that allows slow or high-speed rotation safely with even any part is not in performance.
26. The engine characterised as in claims 1,to 25 this engine design could use Benzene with different kind of octane or Jet kerosene or even Gas fuel by the same principal .Although the flexibility of piston push-arm could provide that, or by relevant changes in their feeding accessories or elastic pistons push-arm.

27. The engine characterised as in claims 1,to26 this engine could be Multi-purposes engine i.e. auto-engine performance ,this could be done by using these various proposals for the controliing devices on :

A/ Air-fuel mixture feeding pipe opening controlled with a regulator for the pistons in a wheel(for pistons in one wheel-energy unit).

B/ Air-fuel mixture feeding pipes opening controlled with regulators for each wheel unit (each energy unit).

C/ Different pistons diameters in any wheel with their particular accessories.

D/ Different pistons numbers in each wheel with the modified distributor .

E/ Different wheels diameters with their particular feeding accessories.

F/ Different piston push-arm (elastic resistance) groups for particular wheel(s) that might use in specific performance i.e. fast acceleration, high speed or in extra heavy work or idle work.

G/ Exhaust opening places ,angles and its wings direction and the location of the terminal exhaust seal.

28. The engine characterised as in claims 1,to,27, The engine characterised as in claims 1,to,29 this engine using the maximum potential fuel energy because of:

A/ Its constant (and longer) moment arm affection of piston P. stroke on Crank.

B / Its positive affection for all pistons movements i.e. all P. strokes on Crank.

C / Its minimum combustion energy loss due to the system slice machinery.

D / Its utilisation of the elastic potential force of the elements .

E /Its utilisation for the best combustion of air-fuel mix in the chamber always.

F/ Its usage of the pressured charged air-fuel mixture to the chambers.

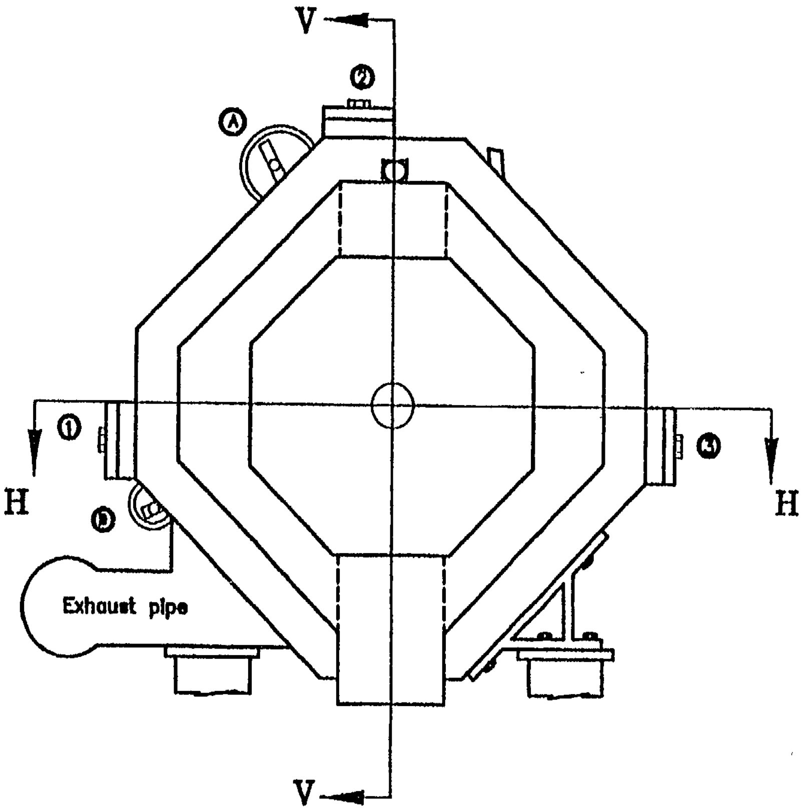
G/ Its utilisation of the aerodynamic power of exhaust gases in output.

H/ Its utilising of all the physical powers occur with the internal combustion.

30. The engine characterised as in claims 1,to 29 this engine could eliminate the gear transmission in a vehicle if working as auto engine, and could use simple fuel spraying device or computerised in stead of the complicated carburettor .

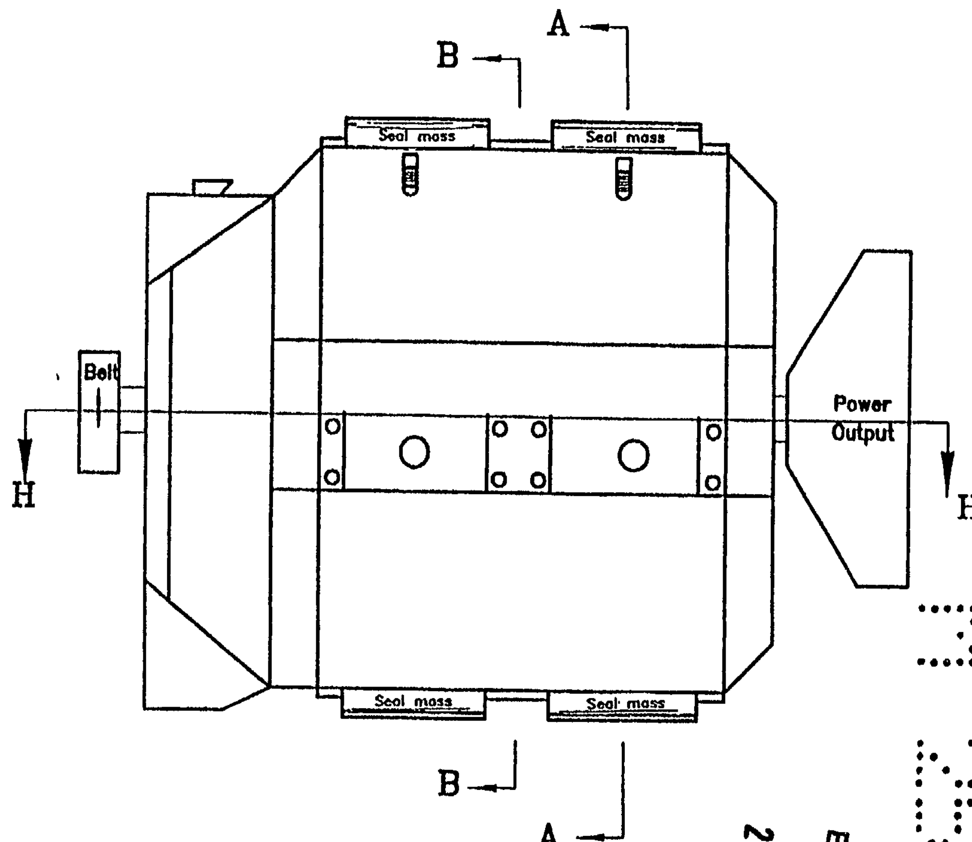
31. The engine characterised as in claims 1, to 30, this engine is utilising the principle of the automatic emission re-fill for the weapon i.e. for shoot-gun and fast-canon and could use the same flexible parts to provide useful ways in transferring this harmful industries to peaceful useful industries ...!

32. The engine characterised as in claims 1,to,31 this engine can work slowly or in a very fast performance due to its smooth, slice rotary speedy efficiency.



TYPICAL SHAPE – FRONT VIEW

F1b

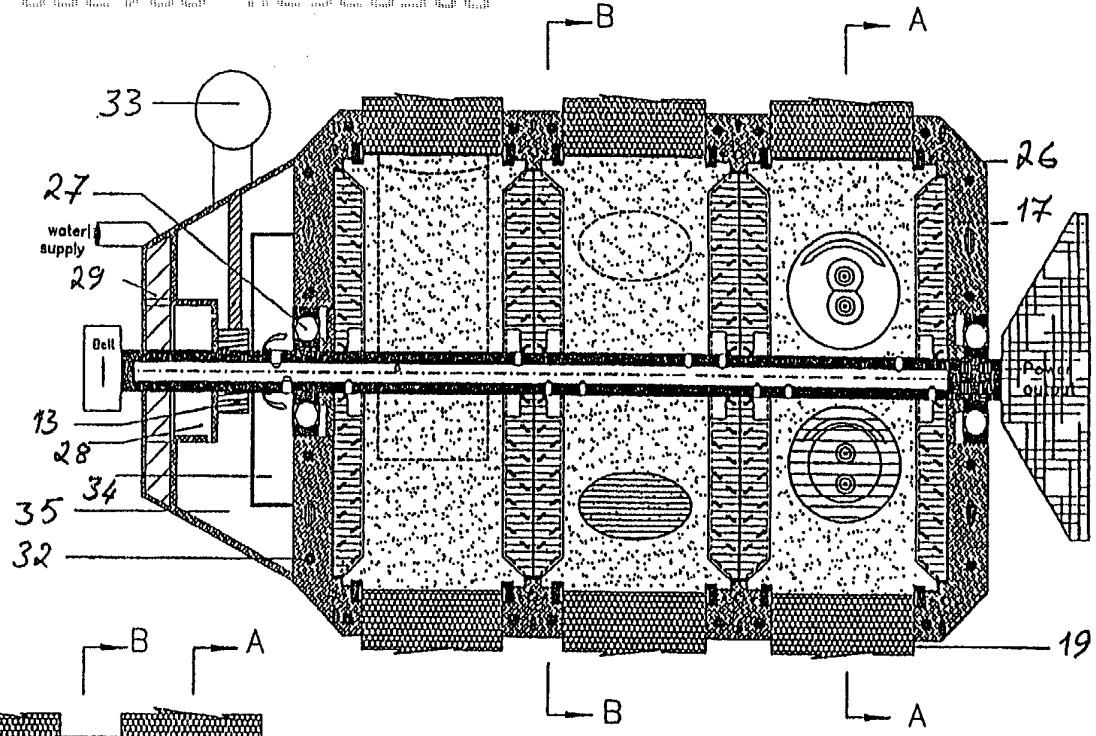


TYPICAL SHAPE – SIDE VIEW

F1a

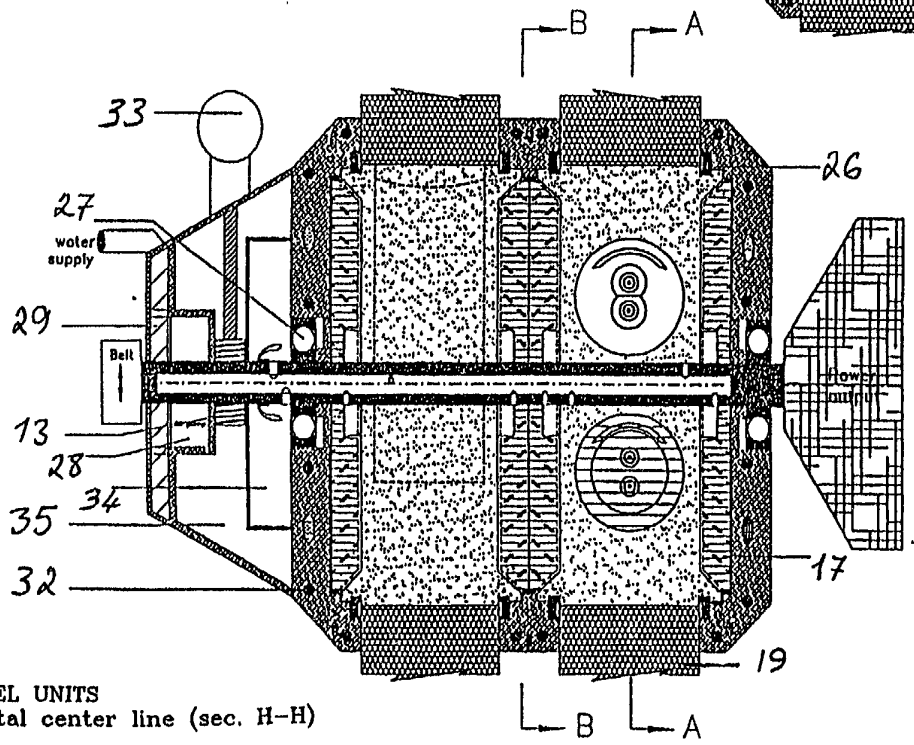
Fig-1

AMENDED SHEET



THREE POWER WHEEL UNITS
Section plan in horizontal center line (sec.H-H)

F-2b



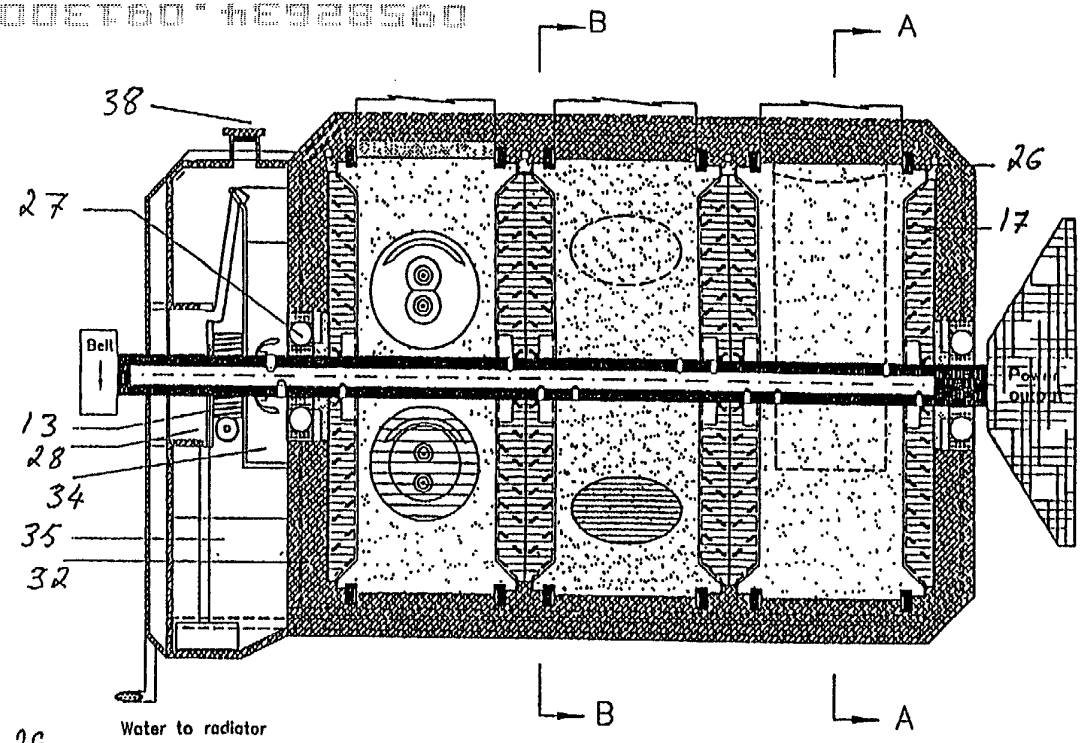
F-2a

TWO POWER WHEEL UNITS
Section plan in horizontal center line (sec. H-H)

- Fig-2 -

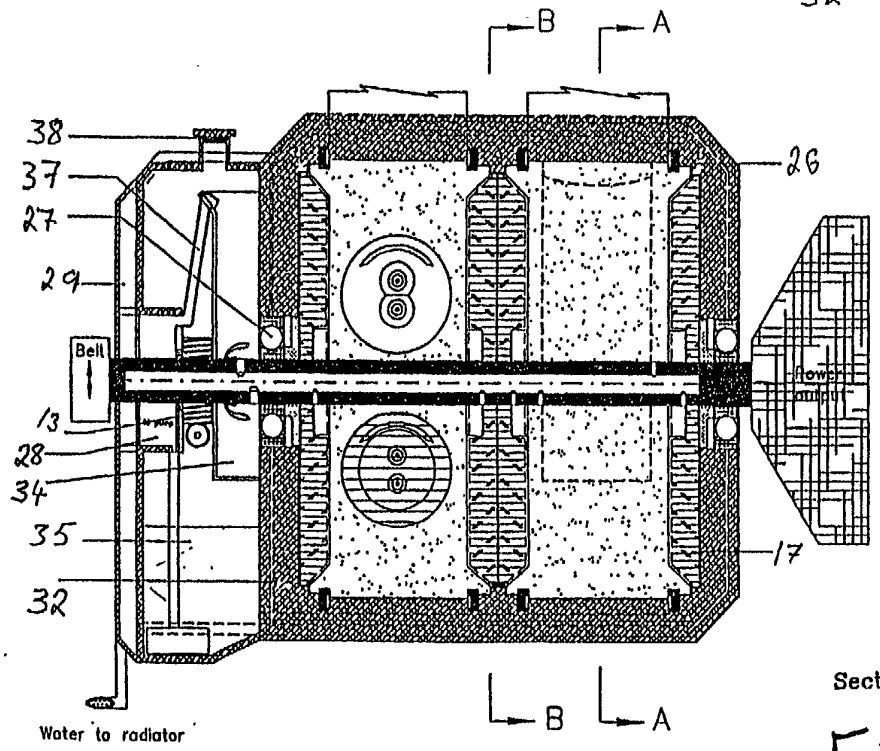
- 2/25 -

AMENDED SHEET



THREE POWER WHEEL UNITS
Section plan at vertical center line (sec.V–V)

F-3b

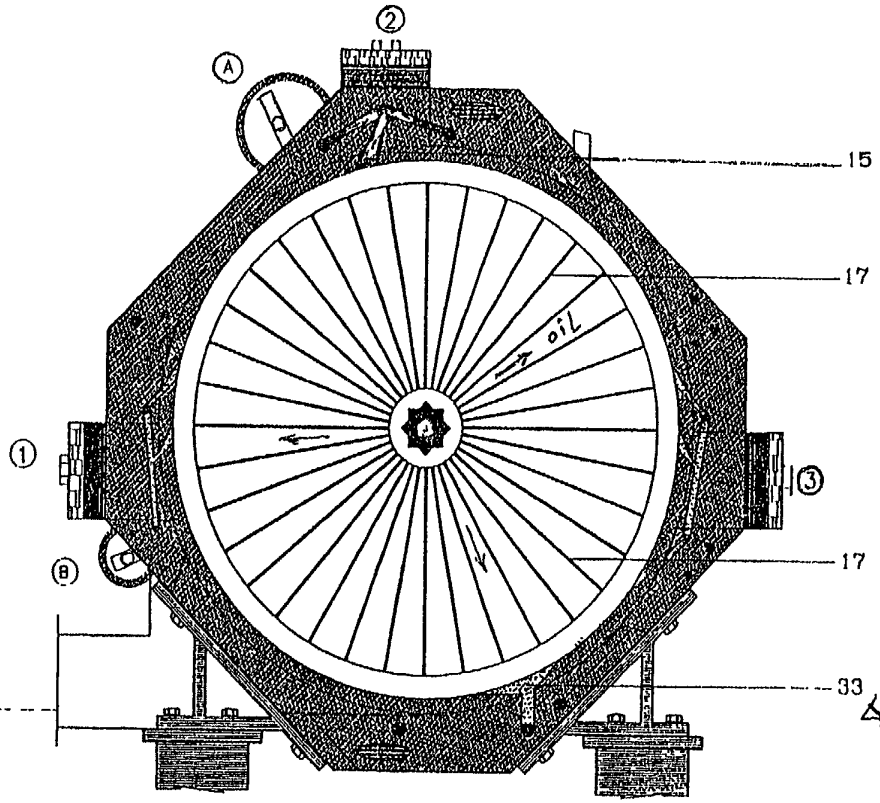


TWO POWER WHEEL UNITS
Section plan at vertical center line (sec. V–V)

F-3a

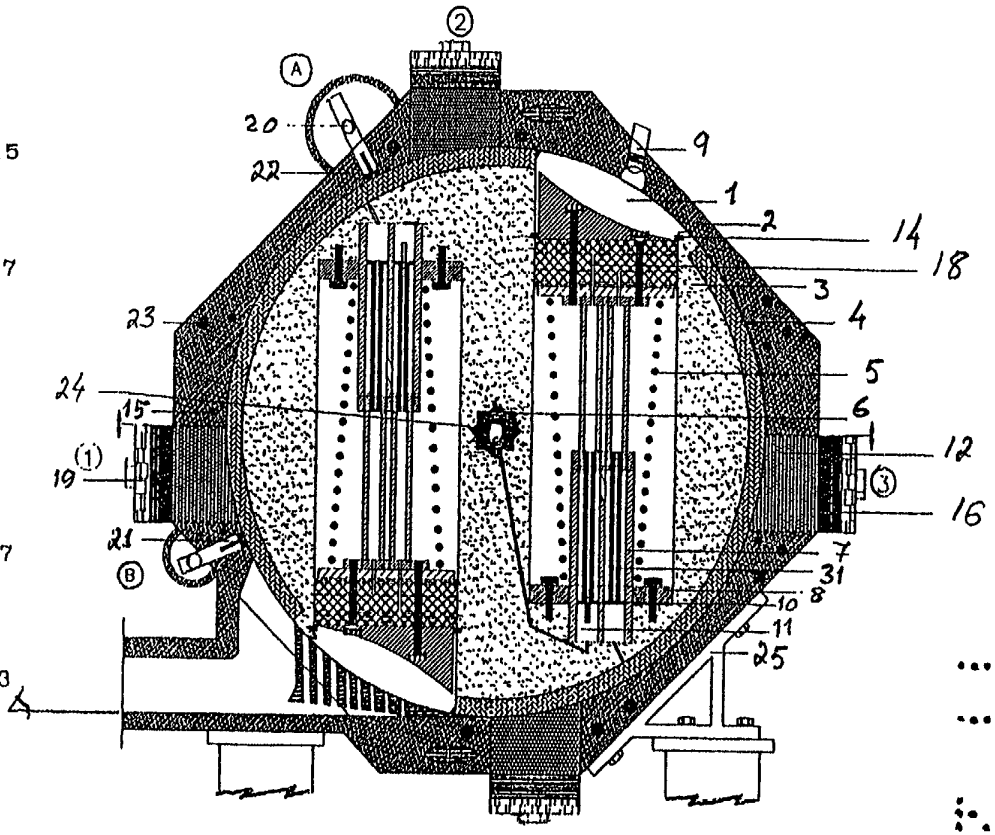
- Fig-3 -

3/7 AMENDED SHEET



SECTION B – B

F-4b



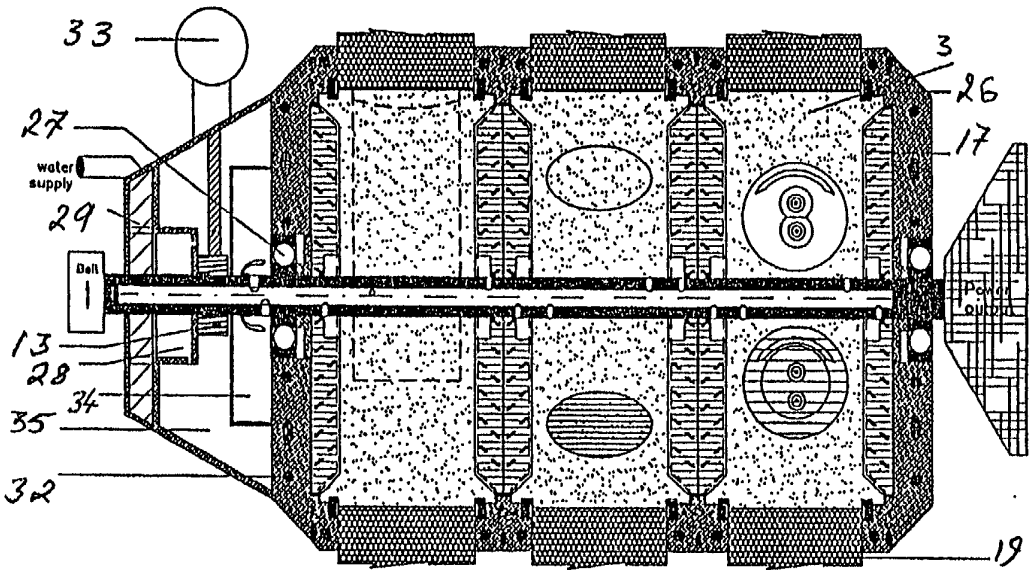
SECTION A – A

F-4a

- Fig-4 -

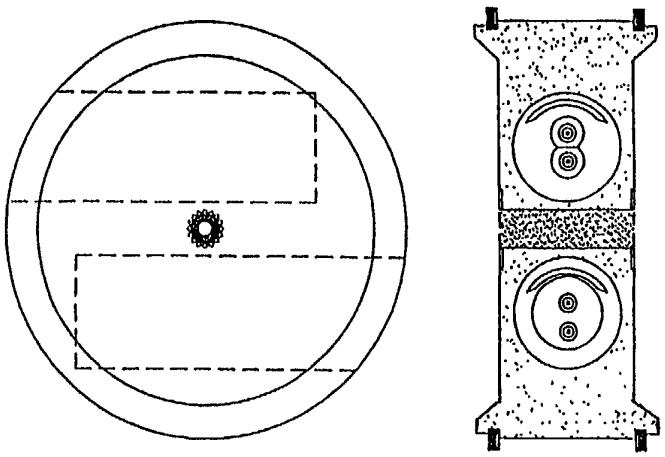
AMENDED SHEET

1/1 F



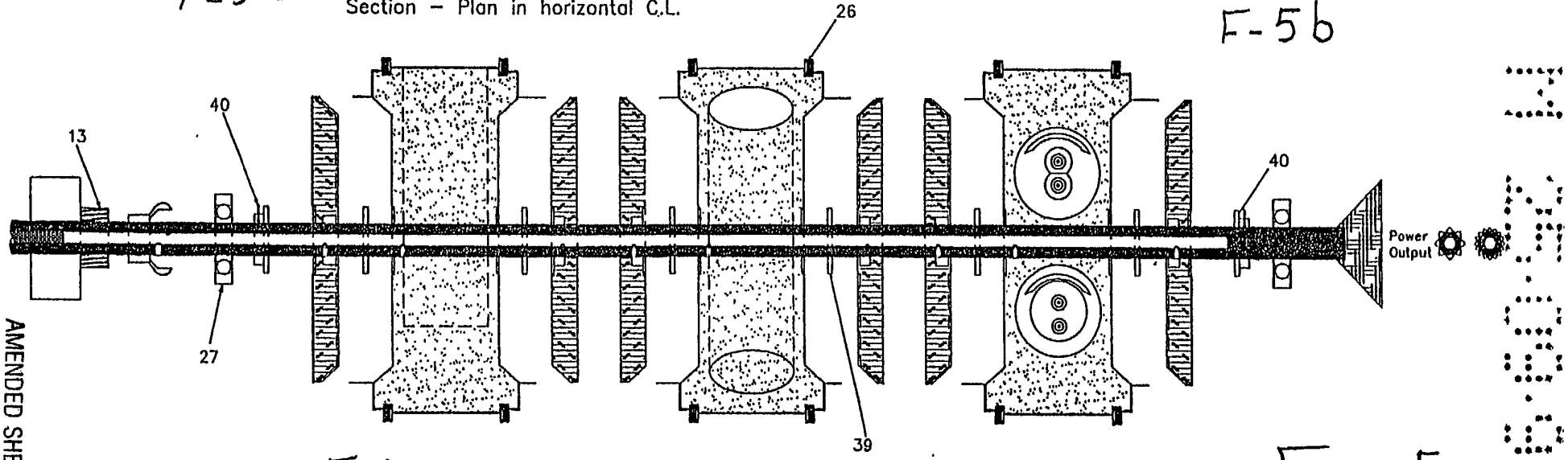
F-5a

Section – Plan in horizontal C.L.



No. 3

F-5b



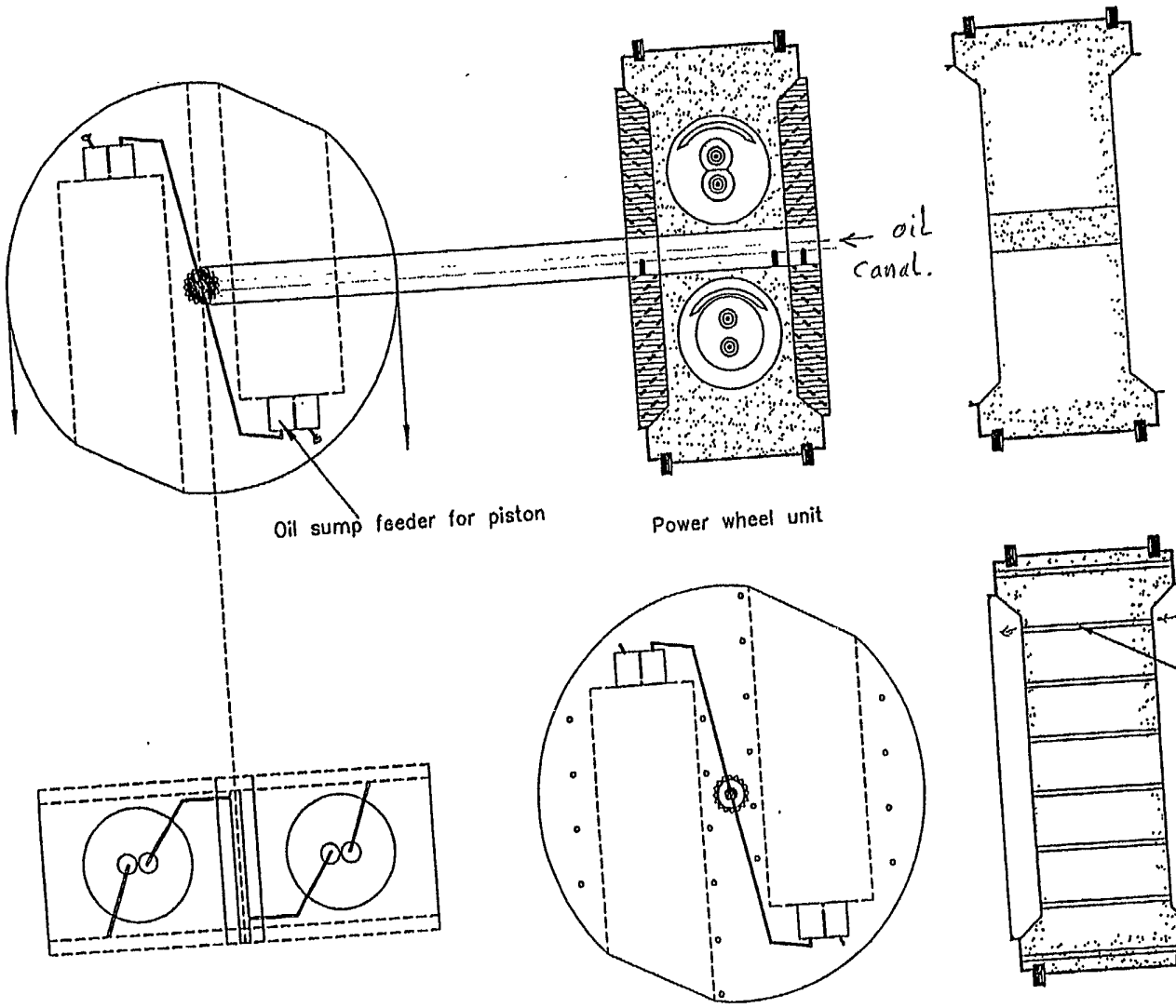
F-5c

ROTATING PARTS ANALYSIS ON THE CRANK

- Fig- 5 -

AMENDED SHEET

5/7



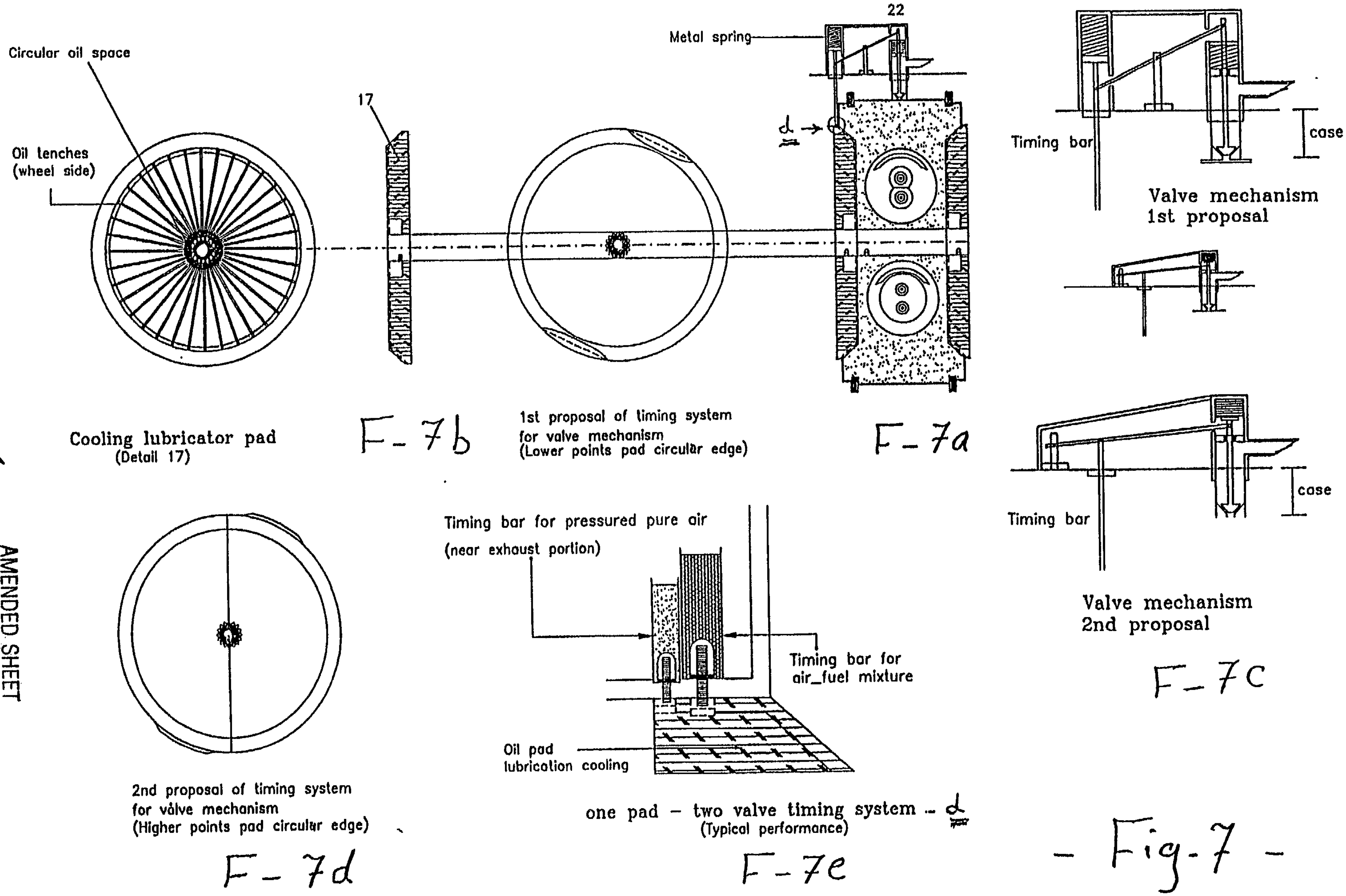
PISTON INLET, OUTLET, OIL SYSTEM

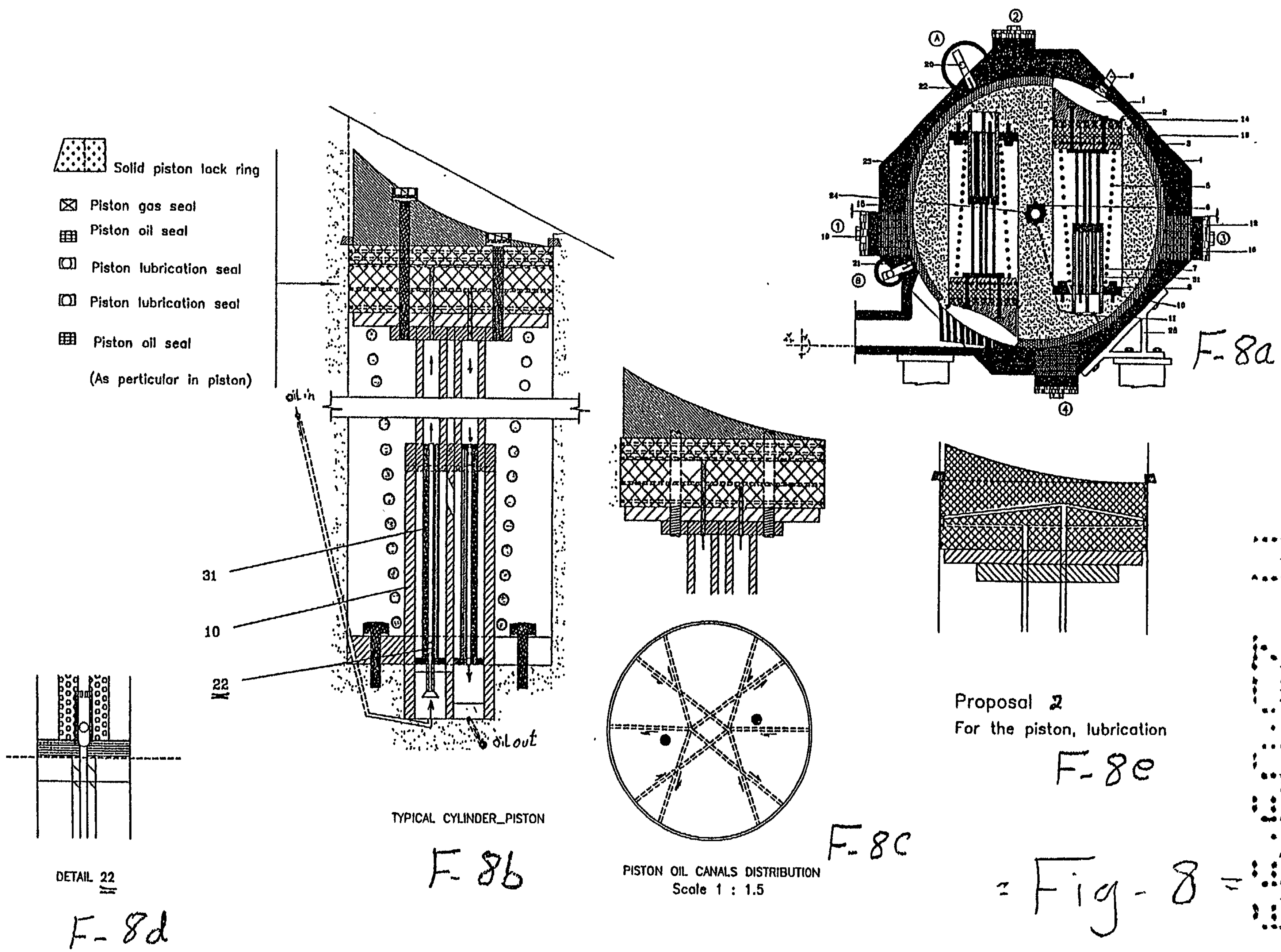
Proposal for additional cooling oil holes in the wheel

F-6a

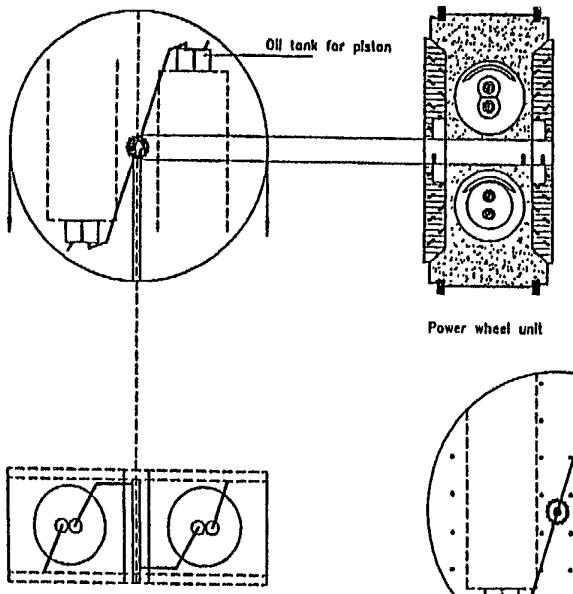
F-6b

Fig-6


Circular oil space
Oil tenches
(wheel side)
17
Cooling lubricator pad
(Detail 17)
F-7b
1st proposal of timing system
for valve mechanism
(Lower points pad circular edge)
Metal spring
22
d →
F-7a
Timing bar
case
Valve mechanism
1st proposal
Timing bar
case
Valve mechanism
2nd proposal
F-7c
2nd proposal of timing system
for valve mechanism
(Higher points pad circular edge)
F-7d
Timing bar for pressured pure air
(near exhaust portion)
Timing bar for
air_fuel mixture
Oil pad
lubrication cooling
one pad – two valve timing system – d
(Typical performance)
F-7e
- Fig-7 -

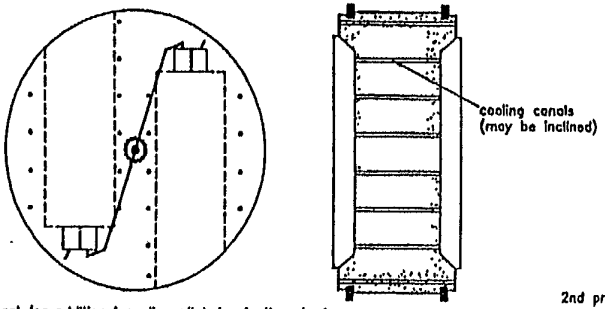


AMENDED SHEET



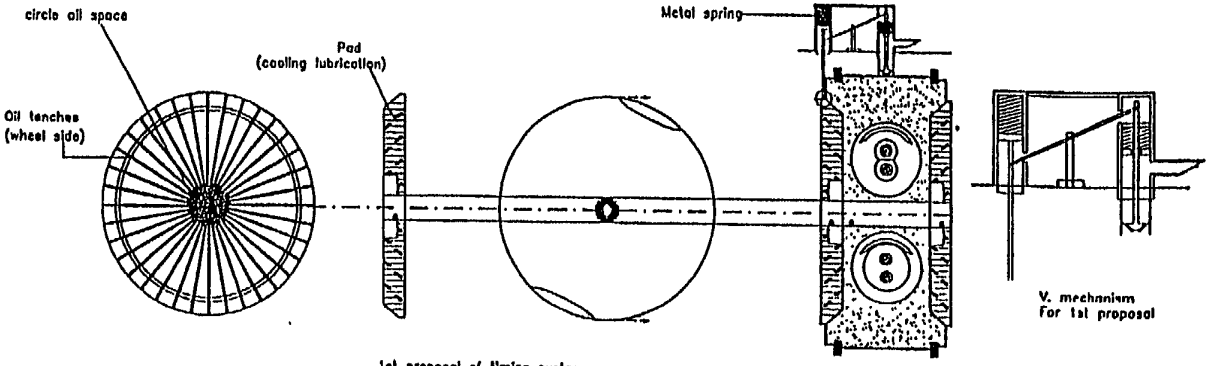
PISTON INLET. OUTLET. OIL SYSTEM

F-9a



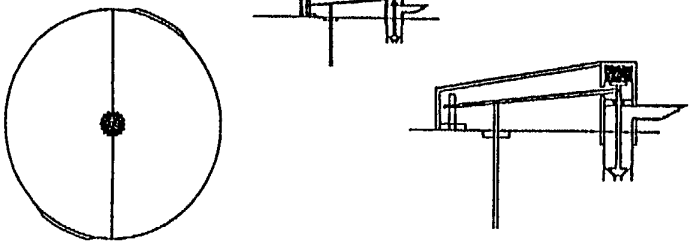
Proposal for additional cooling oil holes in the wheel

F-9b



LUBRICATION COOLING PAD

1st proposal of timing system
with valve mechanism
(Lower points pad circular edge)

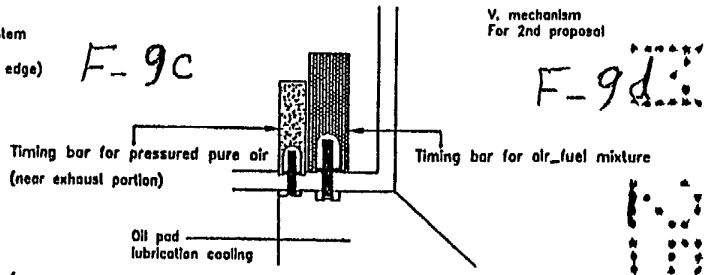


2nd proposal of timing system
with valve mechanism
(Higher points pad circular edge)

F-9c

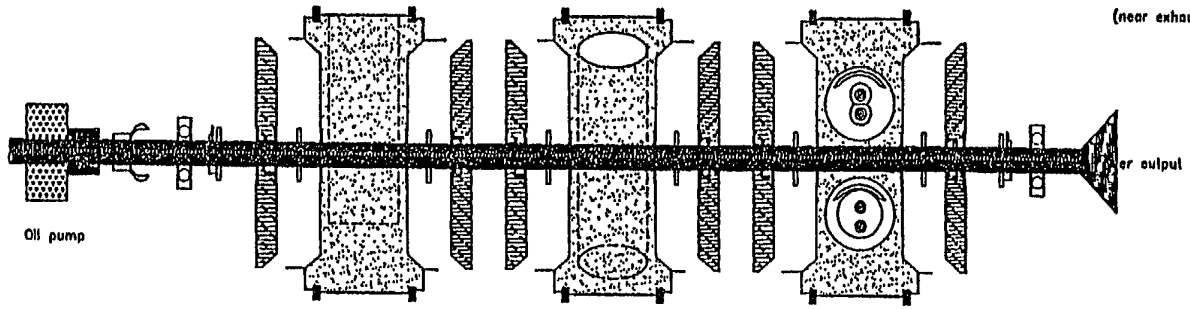
V. mechanism
For 2nd proposal

F-9d



(one pad – two valves timing system)
(Typical performance)

F-9e



NOTE
(Oil inlet hole on shaft as per each part it is not as per scale)

ROTATING PARTS ANALYSIS ON THE CRANK

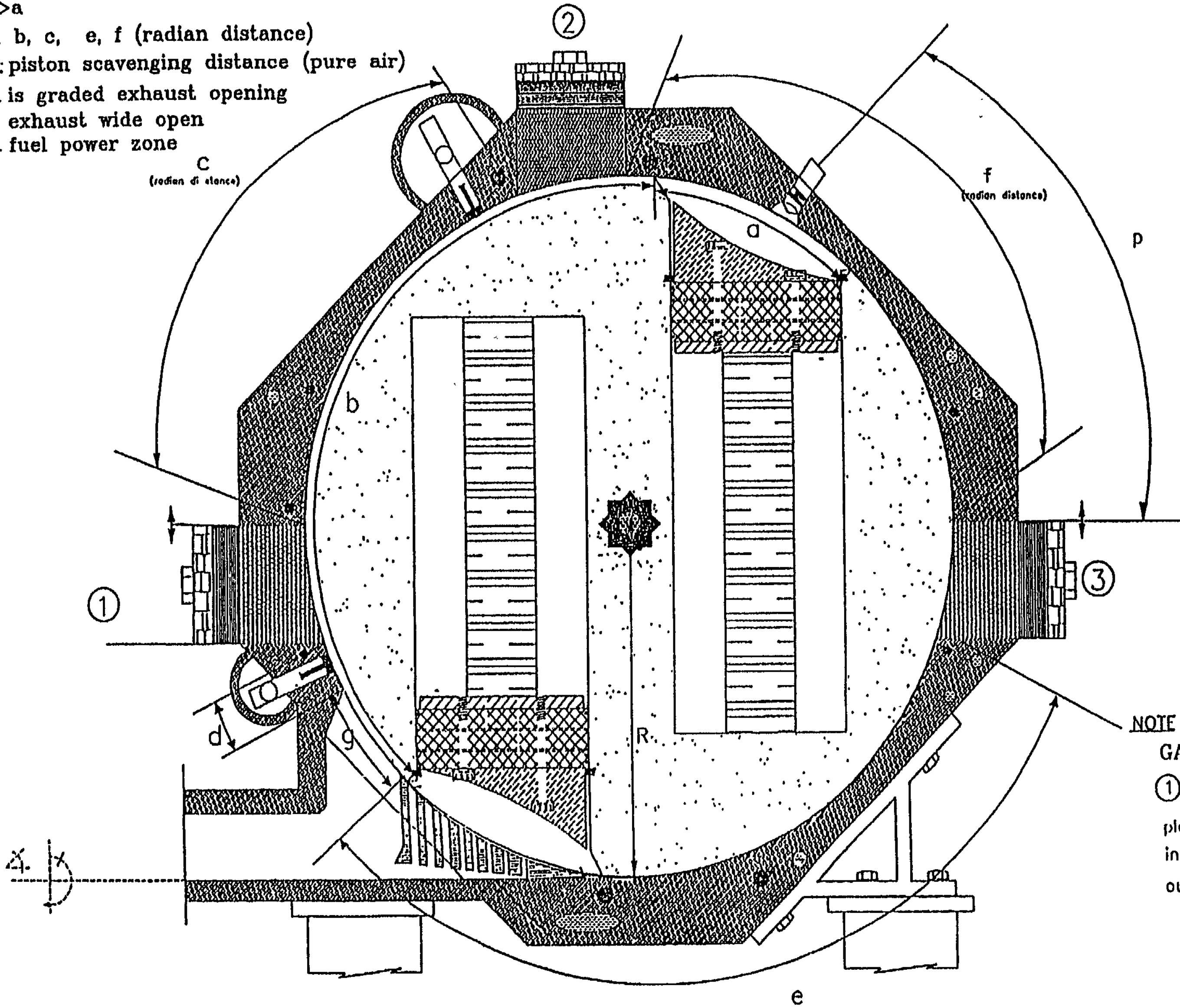
F-9f

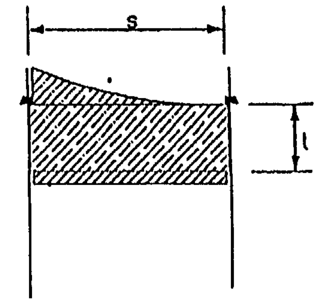
= Fig-9 =

AMENDED SHEET

– 9/15 –

b>c
b>f+1/2a
d>a
a, b, c, e, f (radian distance)
d: piston scavenging distance (pure air)
e. is graded exhaust opening
g exhaust wide open
p. fuel power zone





l : hight of piston cap
s : diameter of piston

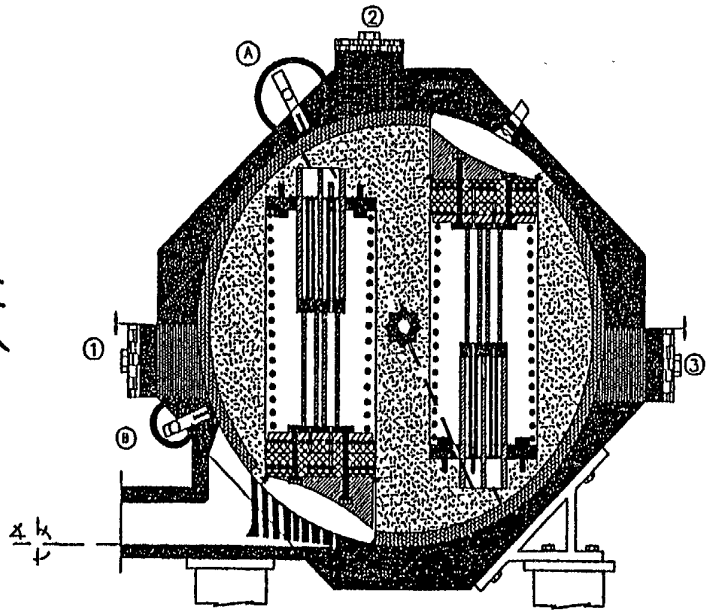
NOTE
GAS SEAL MASS
① ② & ③ Can be replaced in different places as required and could be four pieces in suggested places depend on the outlet ∡ angle and other criterias.

SECTION A – A

Fig-10

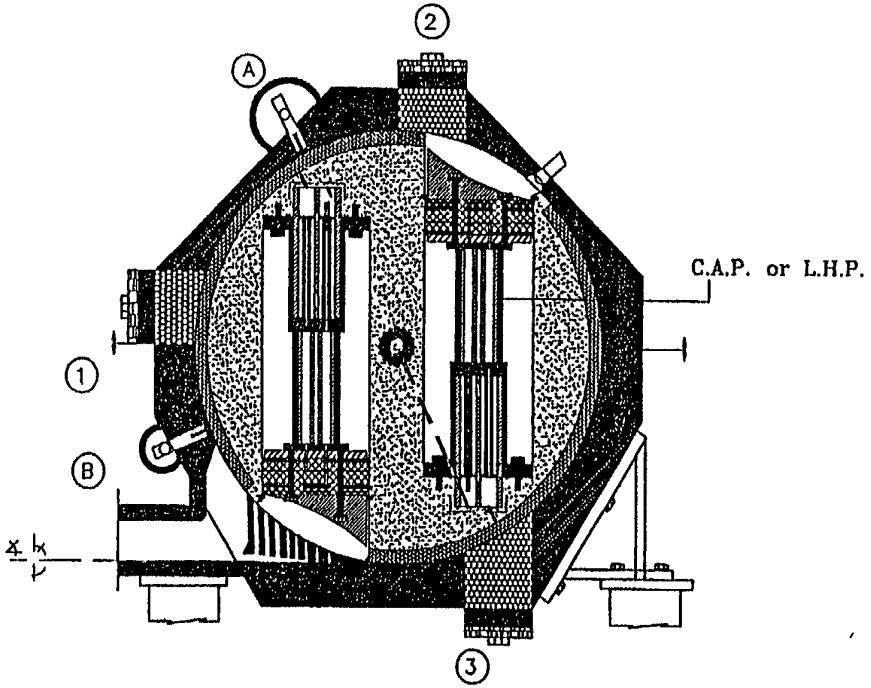
AMENDED SHEET

C.A.P. : Compressured Air Device.
L.H.P. : Liquid Hydraulic Device.



Spring push-arm modification

F_11 a



Hydraulic (device) push arm modification
Compressured air power modified
or liquid (oil) power modified

F_11 b

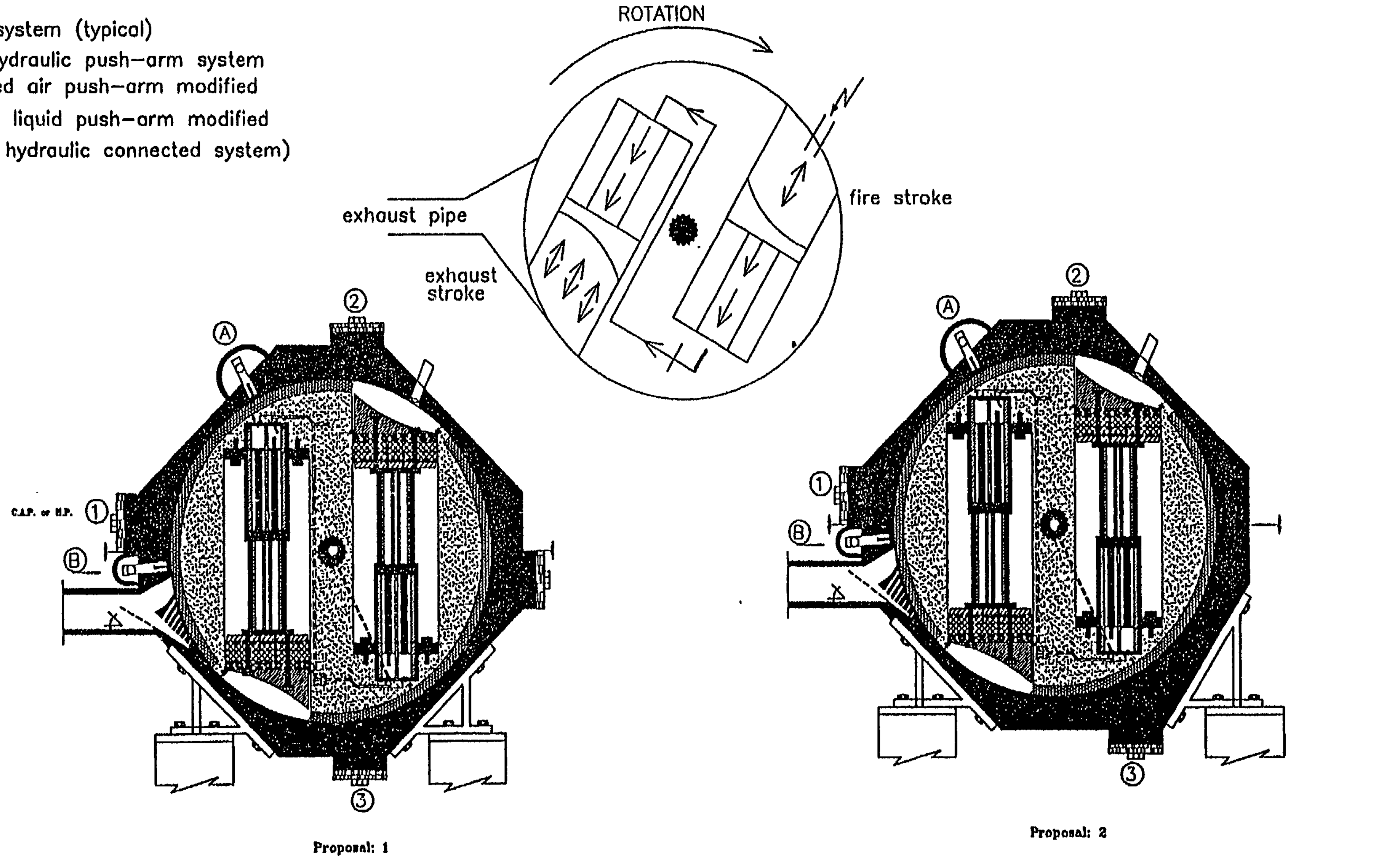
Fig-11

11/25

AMENDED SHEET

C.H.S. : Connected Hydraulic system Push arm WHEEL

Section of system (typical)
Combined hydraulic push-arm system
Compressured air push-arm modified
or Hydraulic liquid push-arm modified
(two piston hydraulic connected system)

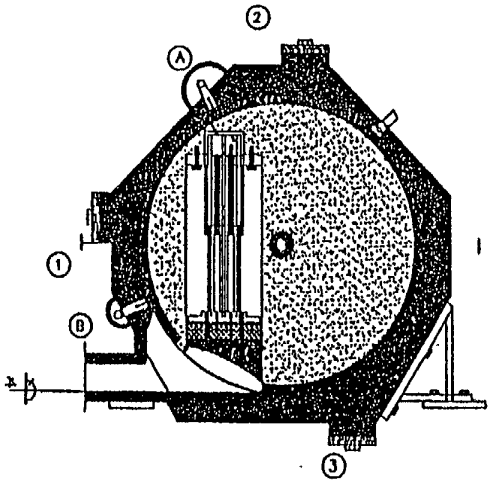


F_12a

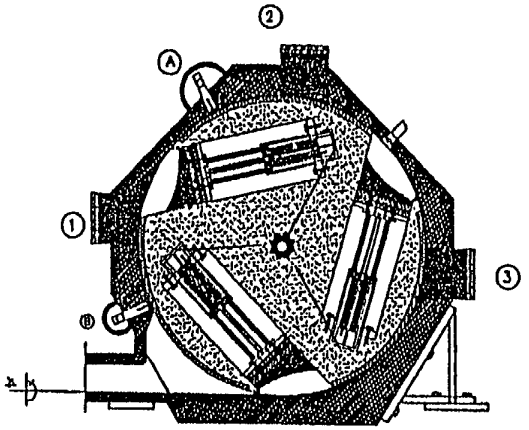
F_12b

Fig-12

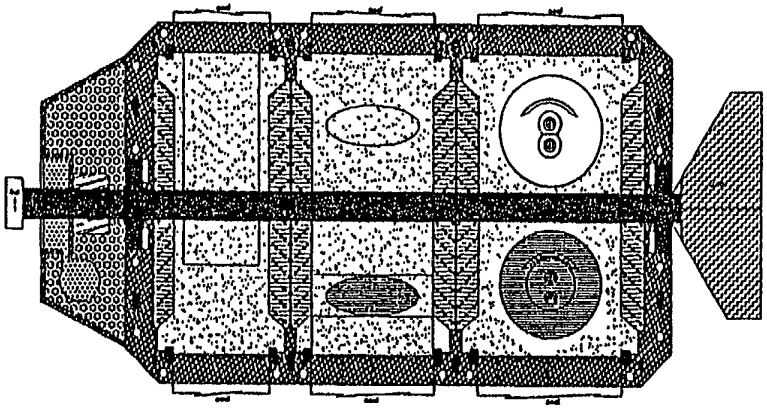
AMENDED SHEET



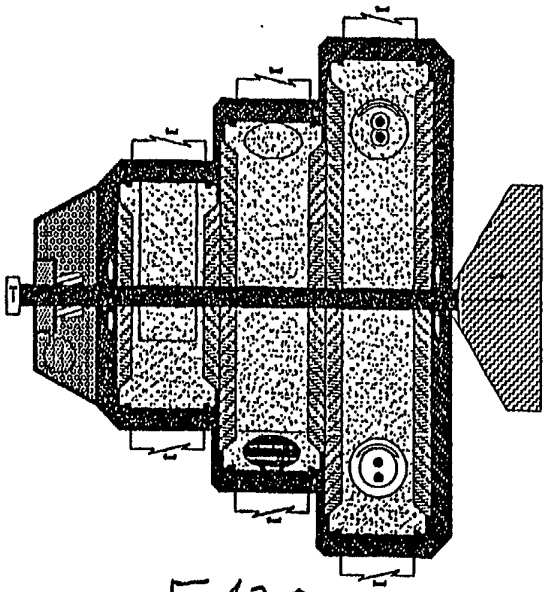
F-13a



F-13b



F-13d



F-13c

Fig-13

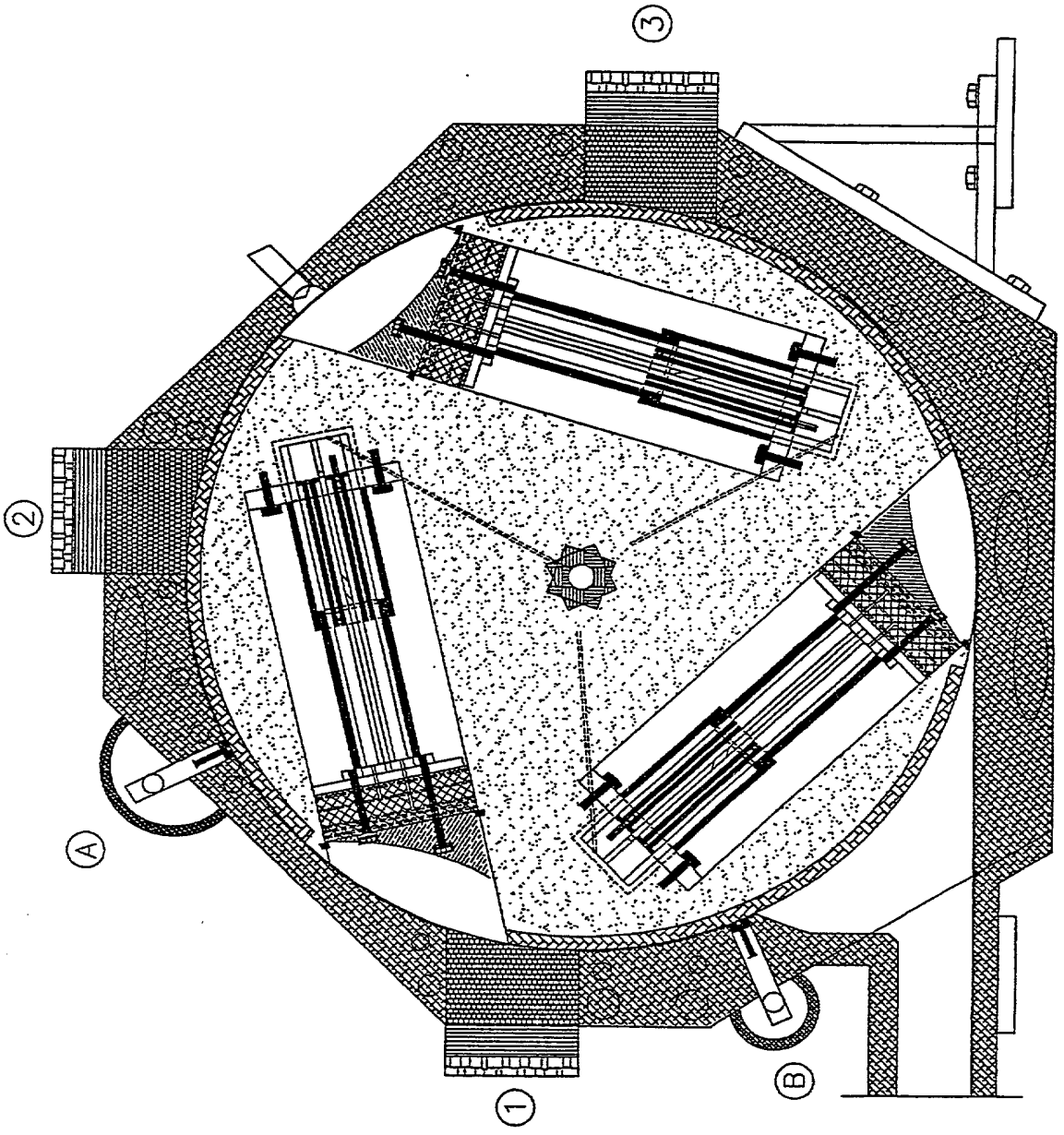


Fig - 14

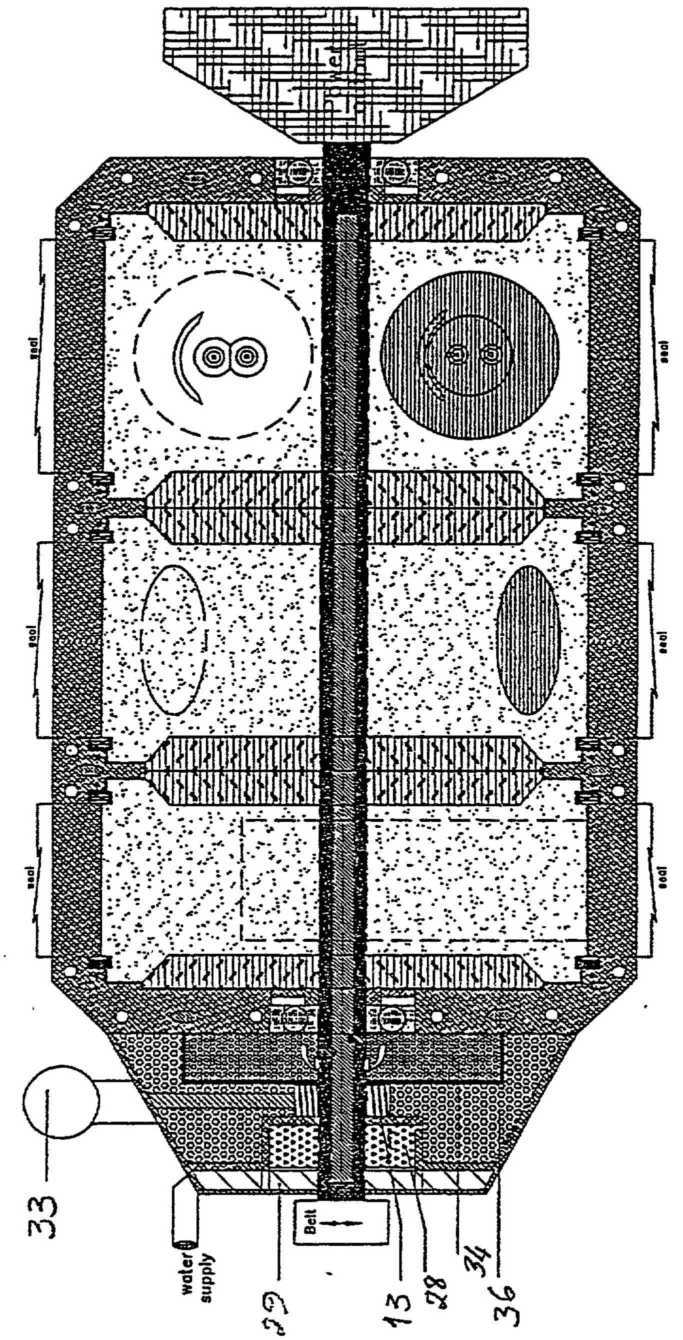


Fig. 15

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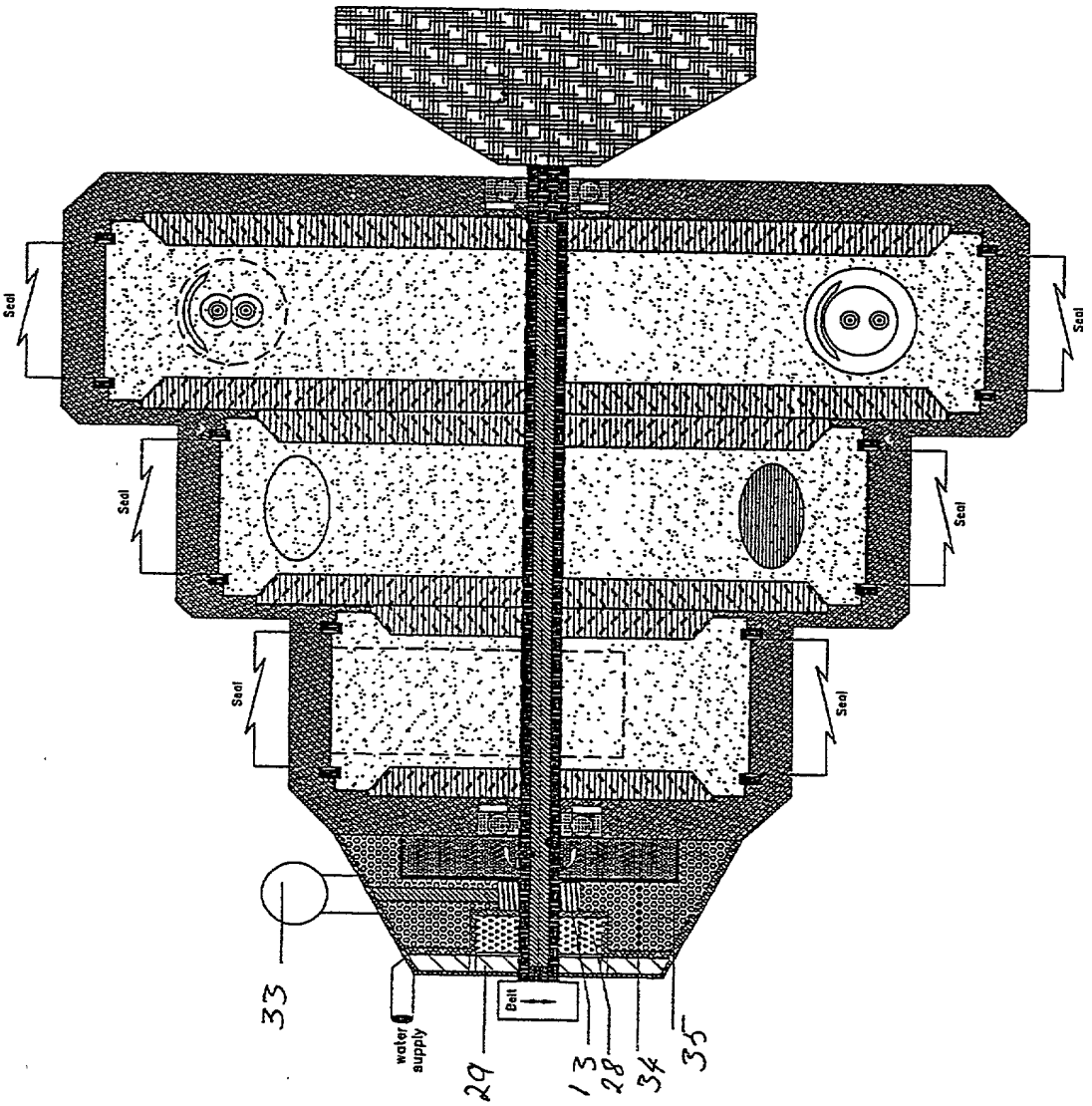

Fig - 16

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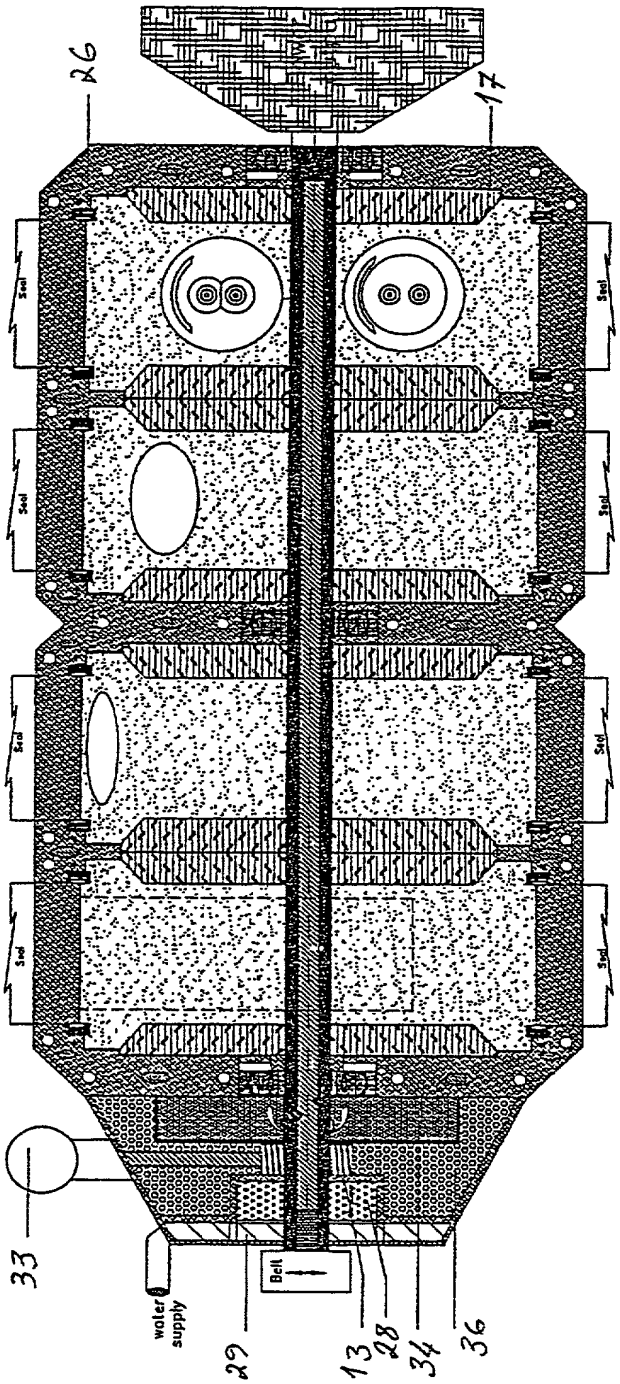
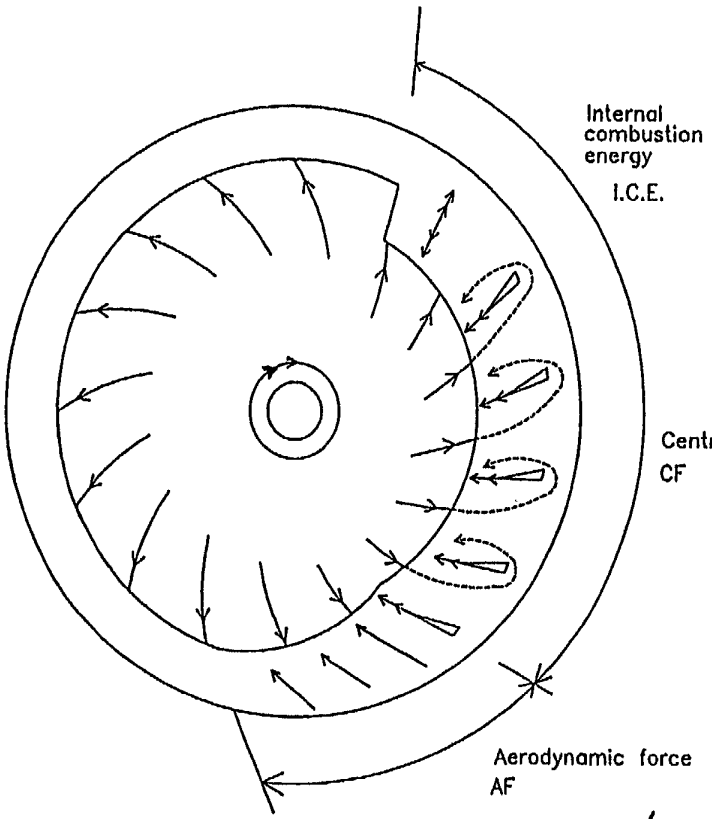


Fig-17

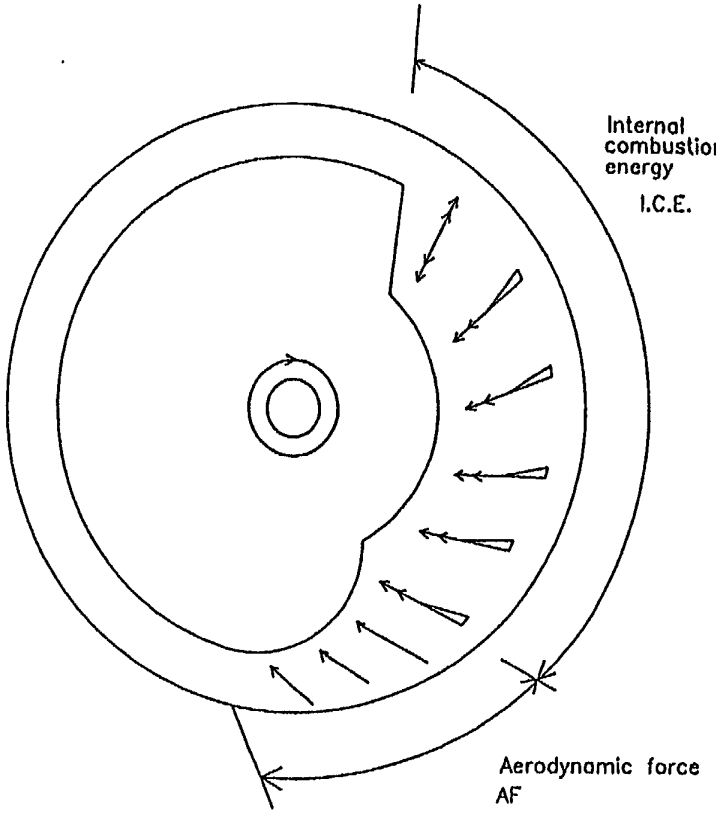
DETAILS OF ENGINE FORCES



Fast speed

F-18b

P = I.C.E. + C.F. + A.F.



Slow speed

F-18a

P = I.C.E. + A.F.

Fig-18

NOTE

Component elements are not in actual scale

18 / 25

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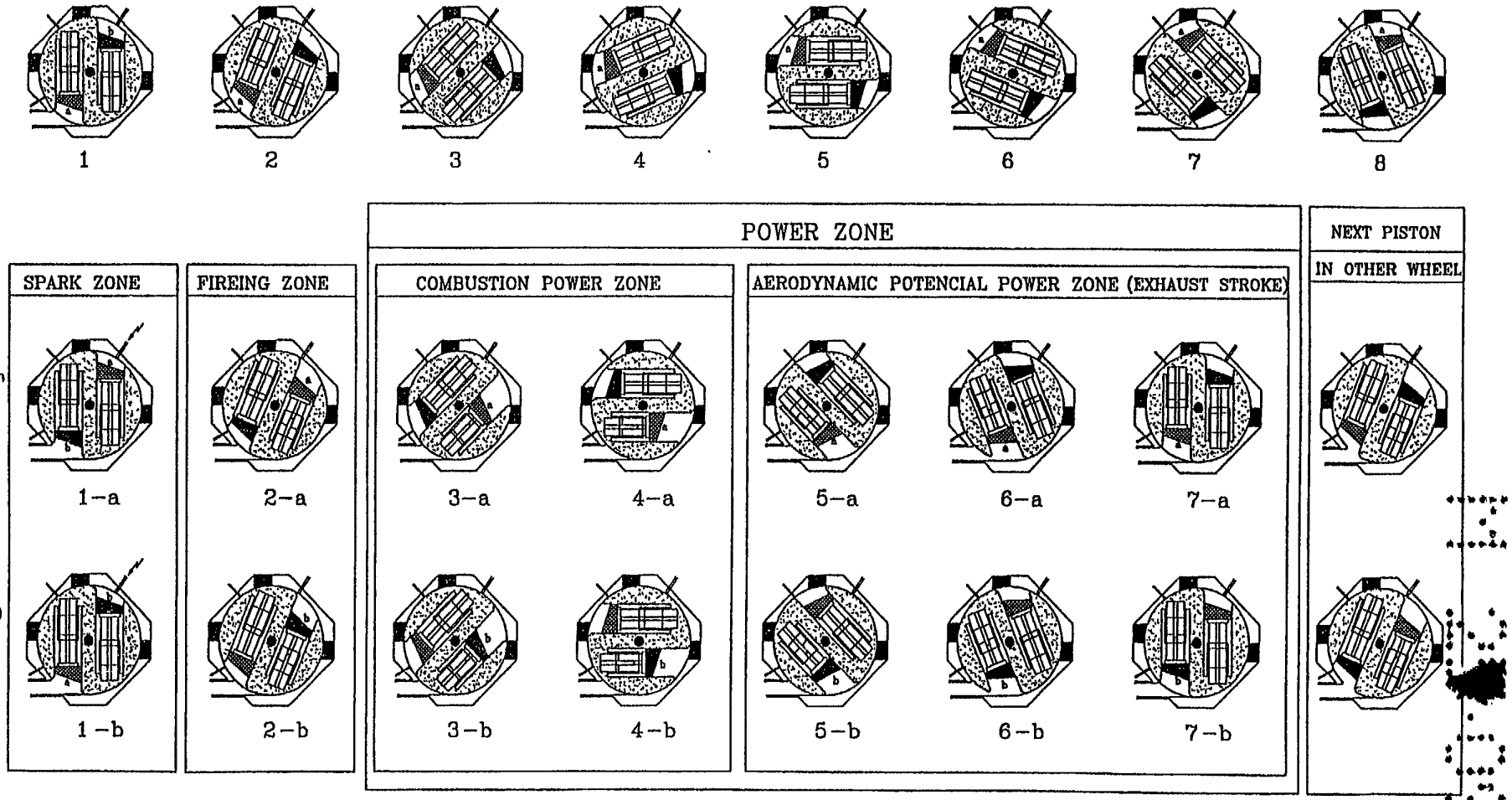

Fig-19

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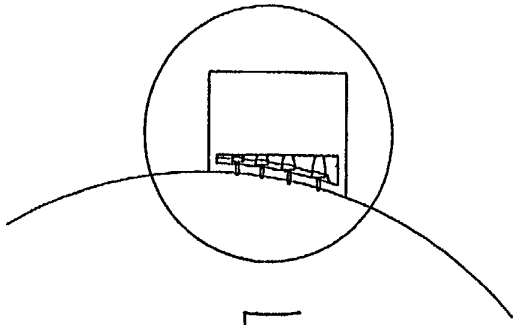
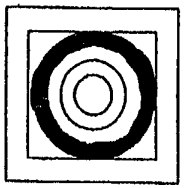
Proposal for seal mass

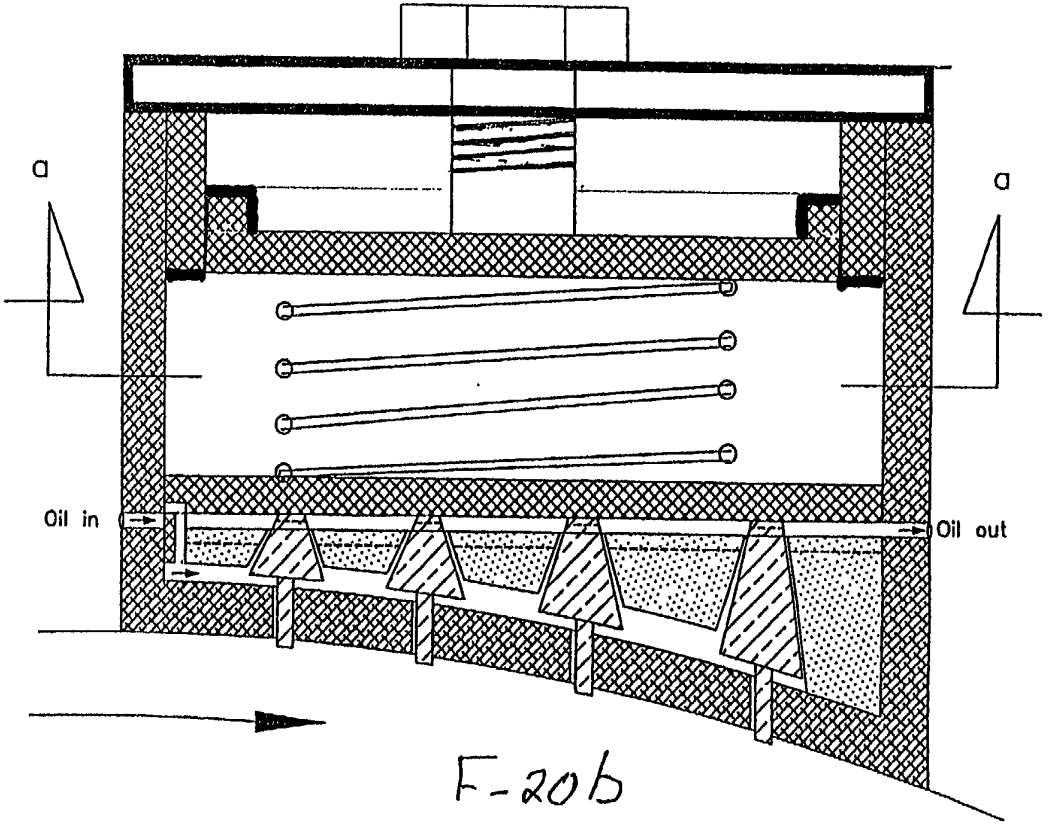


F-20a



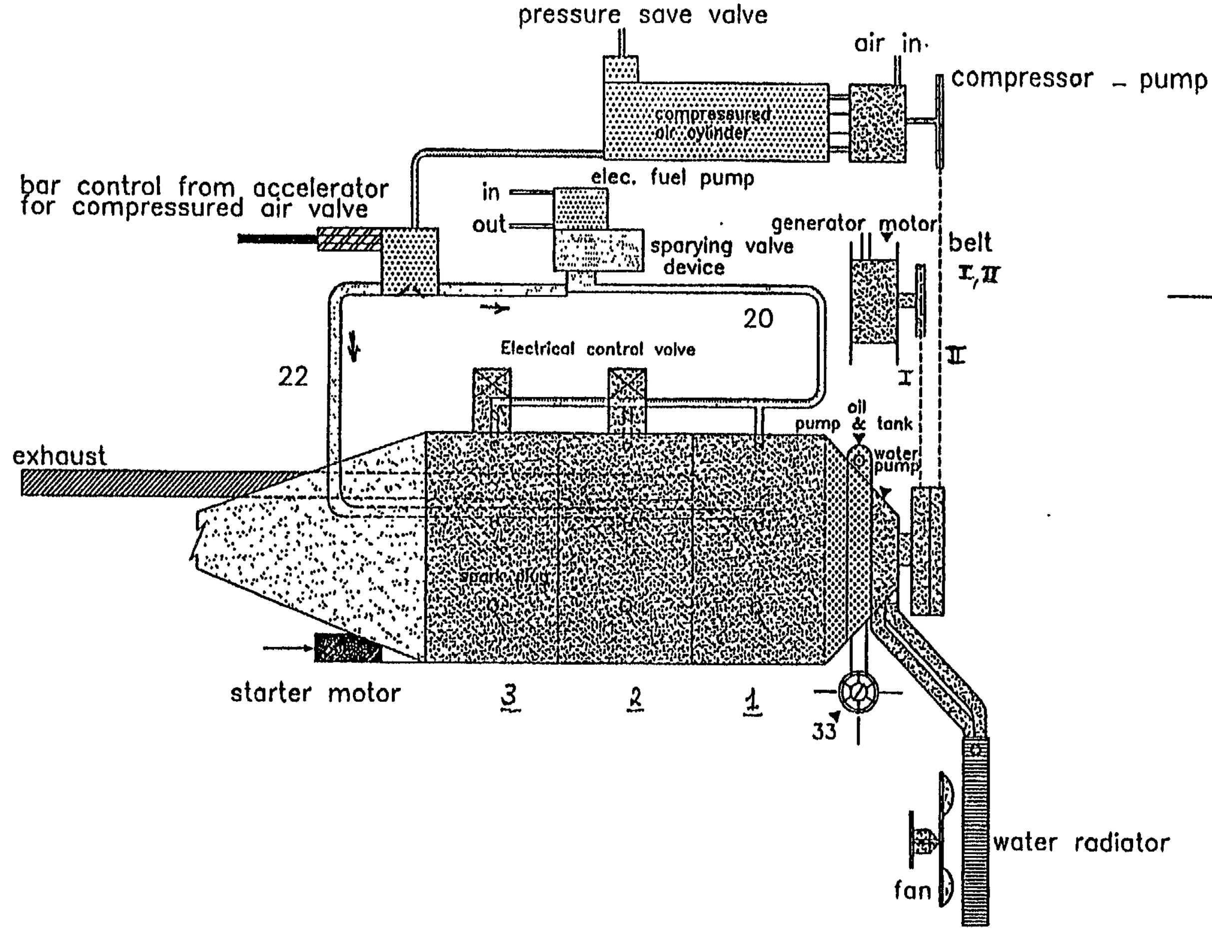
Section a – a

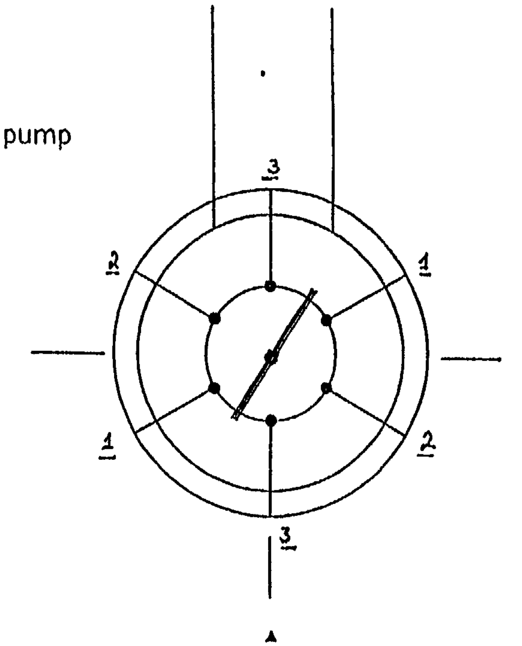
F-20c



F-20b

Fig-20





Simple ignitions distributor
for two pistons wheel
mechanical or (electrical)

Proposal No: 1.
Fuel spray injection for:- all – fuel.air-mix inlet

Fig - 21

25.09.99

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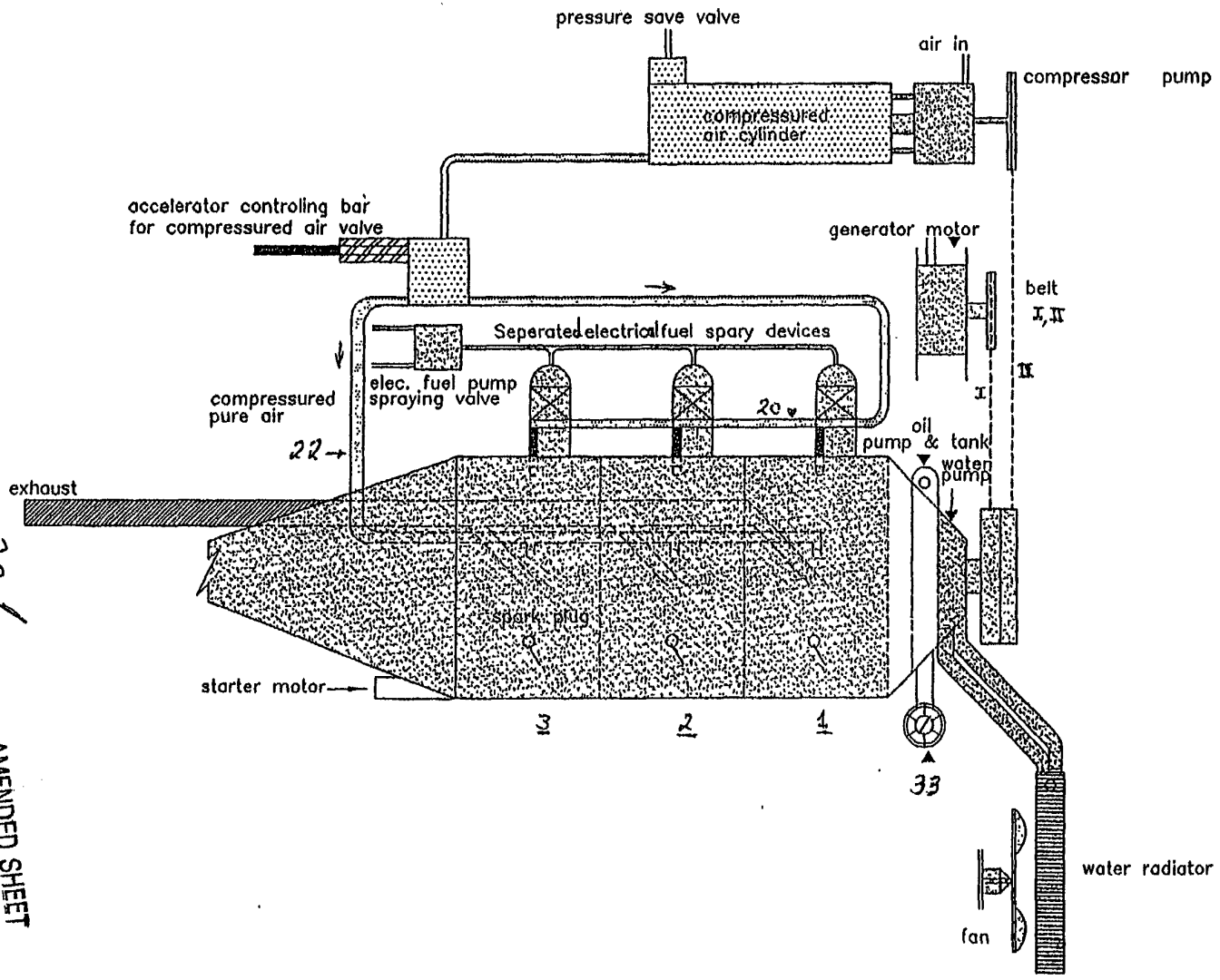
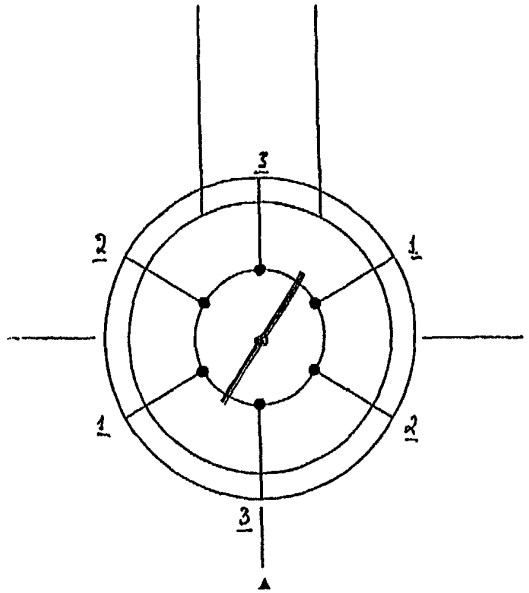




Simple ignitions distributor for two pistons wheel x 3 mechanical or electrical

Proposal No: 2.

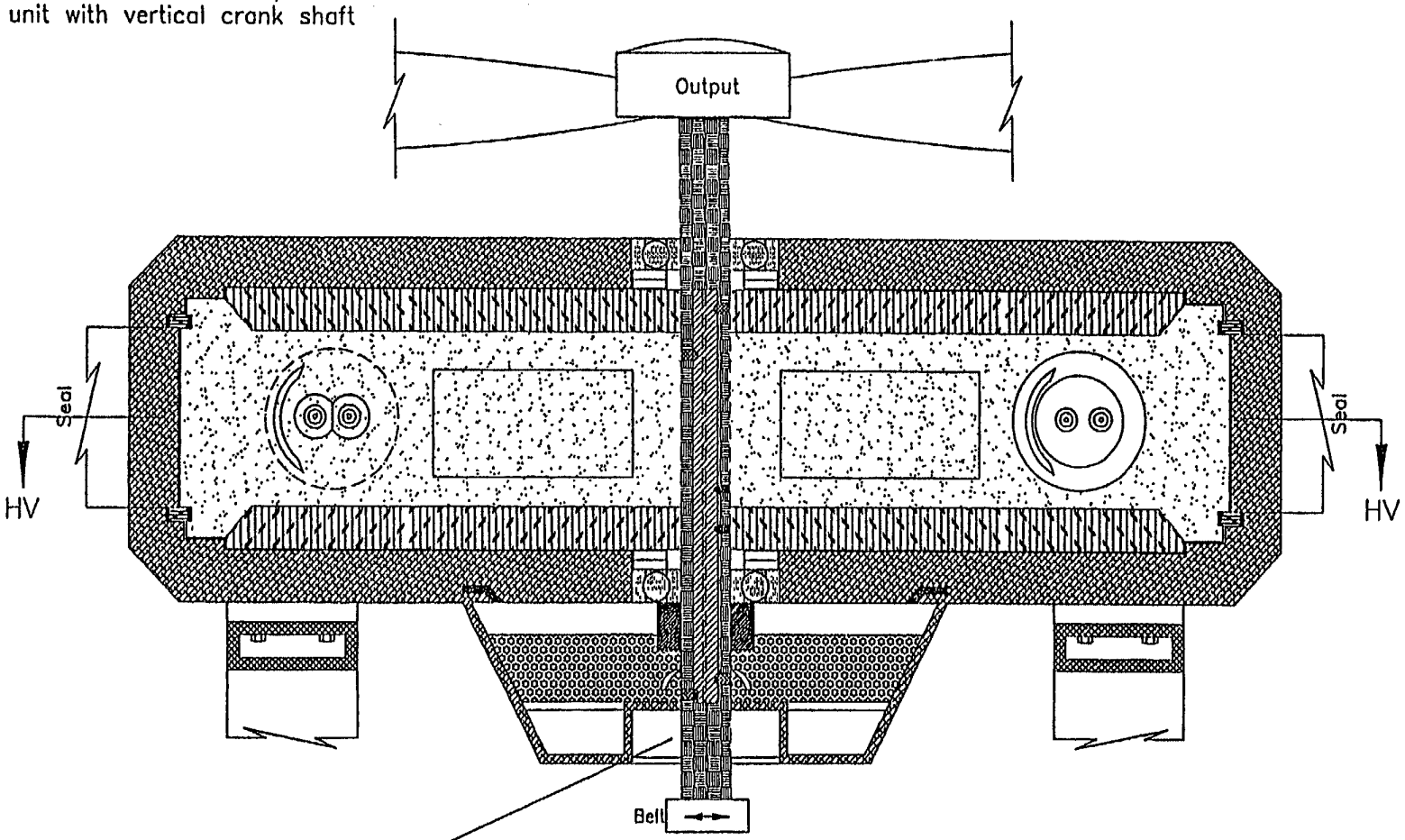
Fuel spray injection for each energy unit: separated – fuel air–mix. inlet

Fig-22

22/1

AMENDED SHEET

Typical unit with vertical crank shaft



Oil pump not necessary
(Using any oil cooling proposal)

One big power wheel unit
(One big energy unit)

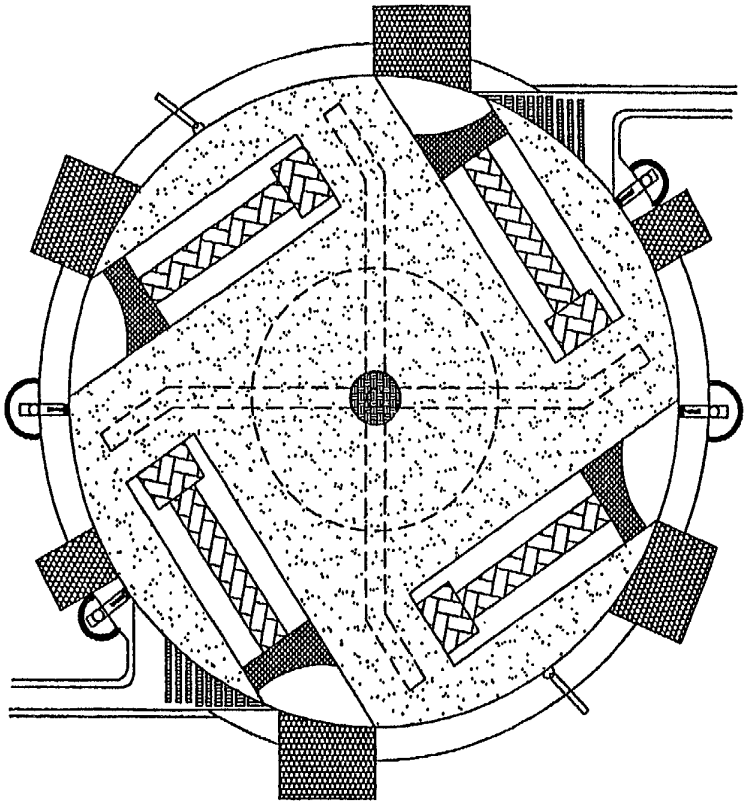
Super Power Wheel Unit
(Dual combustion ignition system or more)
Typical Section in vertical C. L.

Fig-23

- 23/25 -

AMENDED SHEET

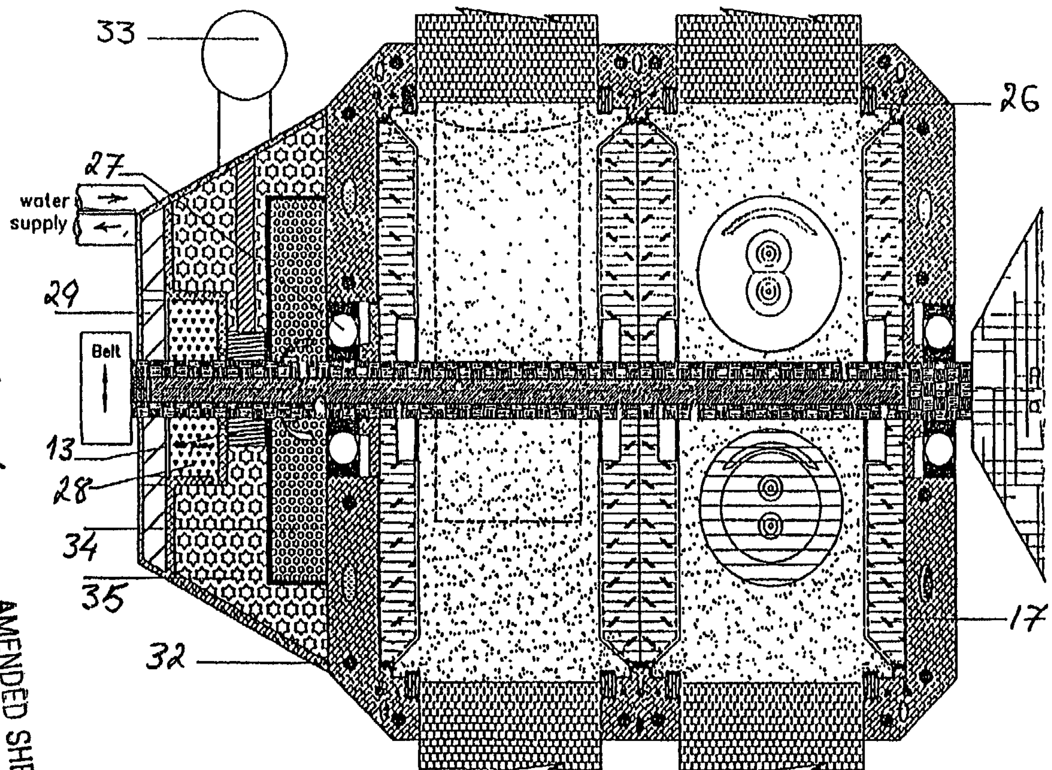
Typical unit with four pistons
Using dual ignition system
Section in horizontal C.L.
(for vertical crank shaft)



section HV – HV
A super Power Wheel Unit
(Dual combustion ignition system)

Piston cup's carve as specified

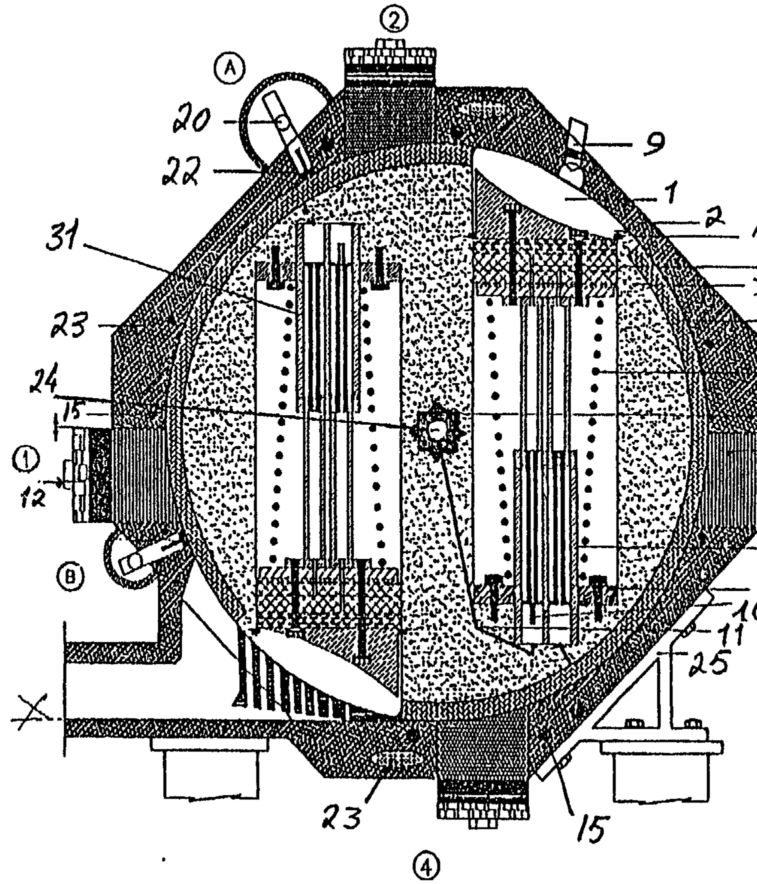
Fig-24



F-25b

TWO POWER WHEEL UNITS
Section plan at horizontal center line (sec. H-H)

scale:
Auto-cadp.



SECTION A – A
Section plan at vertical c. l. of power wheel
(A typical spring power modified)

F- 25a

Fig-25

AMENDED SHEET

M 25.09.99

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PTO/SB/01 (12-97)
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Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted with Initial Filing OR ✚ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	
First Named Inventor	
COMPLETE IF KNOWN	
Application Number	09/582634
Filing Date	07/27/2000
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

SHIRWO SYSTEM(ANEW INTERNAL COMBUSTION POWER SYSTEM)

(Title of the Invention)

the specification of which
☐ is attached hereto
OR
✚ was filed on (MM/DD/YYYY) 01/29/1999 as United States Application Number or PCT International Application Number PCT/IB99/00178 and was amended on (MM/DD/YYYY) _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: ☐ Customer Number [ ] → *Place Customer Number Bar Code Label here*
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☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

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Name	AL PASHA AL BAHDAINI Shirwan				
Address	8 Rue David-Dufour				
Address					
City	GENEVA	State		ZIP	CH-1205
Country	SWITZERLAND	Telephone		Fax	0041223044359

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
SHIRWAN ALPASHA	AL BAHDAINI

Inventor's Signature	[signature]					Date	08 Sep. 2000
Residence City	GENEVA	State		Country	SWITZERLAND	Citizenship	CH/IRAQ
Post Office Address	AL PASHA AL BAHDAINI Shirwan						
Post Office Address	8 Rue David-Dufour						CHX
City	Geneva	State		ZIP	Ch-1205	Country	SWITZERLAND

☐ Additional inventors are being named on the ____supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto